# Electricity on the Farm

*A Monthly Magazine for the Progressive Rural Family*

MARCH
1931

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For Equipment Dealers and Power Company Representatives

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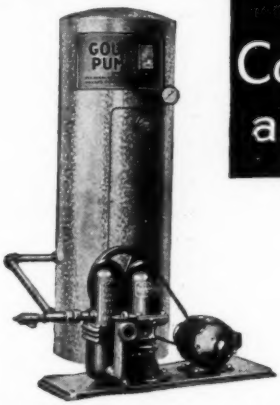

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# The Most Complete Electric Range Ever Built

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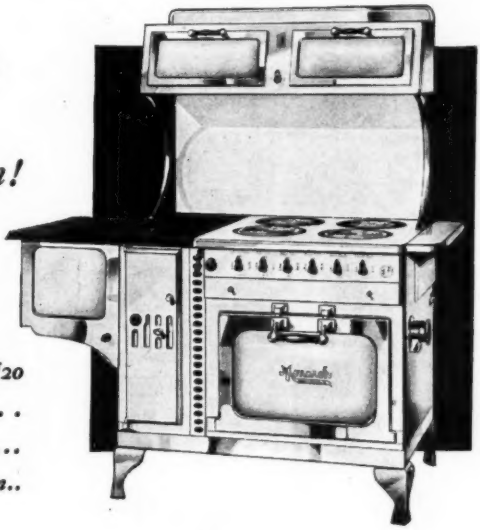

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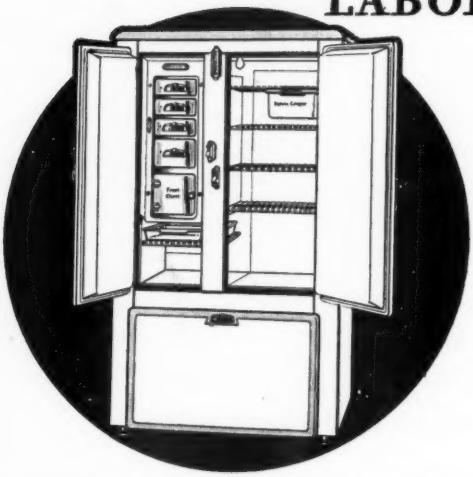

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(221)

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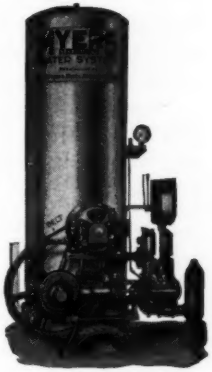

**Fig. 2510**

A complete Water System Unit for wells up to 22 feet in depth, with 42 gallon pressure tank. Entirely automatic in action — self-starting, self-stopping, self-oiling. Capacity 250 gallons per hour.

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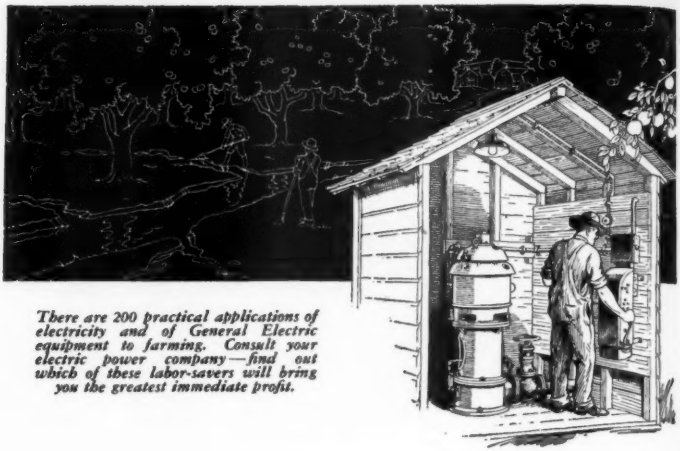

*There are 200 practical applications of electricity and of General Electric equipment to farming. Consult your electric power company—find out which of these labor-savers will bring you the greatest immediate profit.*

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GENERAL ELECTRIC

# ELECTRICITY ON THE FARM

MARCH, 1931

"March, slayer of winter, art thou here again?"—Wm. Morris. Yes, March is already upon us, and soon we'll have to give thought to putting equipment in shape for spring work. And here's just where the electrified farm shop can help.

## Profit in Preparation

There is an old proverb, "A man prepared has half fought the battle," that applies equally as well to agriculture as to the army. For preparation, after all, is the foundation of success in any undertaking.

Spring will be upon us within a few weeks and then thought must be given to getting the farm equipment into shape for field work. It's too late to start reconditioning and repair work when the fields are ready for the plow, for once the outdoor work gets under way there's little time for shop work.

The farmer with an electrified work shop is in an infinitely better position to keep his machines in good condition than is the farmer not so equipped. Electric light eliminates the handicap of repair work after dark; electricity takes the place of muscles in running such shop equipment as drills, lathes, grinders, saws and bellows, and does a better job. An electric heater will make it comfortable at the work bench in chilly weather, while a fan will keep the neighborhood of the bench cool during hot weather.

Even though the evenings are still long, there is no reason for putting off repair work, when the efficient electric light is available. An hour spent in the shop at this time will be worth many an hour a couple of months later. With all farm equipment in good shape for immediate use, a start can be made the moment the weather makes the field suitable for working. Yes, sir, there is profit in proper preparation.

# EASY FEED GRINDING

By A. J. LUTZ

**The feed grinder hook-up on the Lutz farm**

ON this farm we used to go to mill about once a week during the winter. Through the summer while the cows were on pasture we did not have to go quite so often, but the meal bin seemed to develop the habit of going empty just when farm work was most pressing.

So, shortly after we were connected with the Detroit Edison power line, I began to consider a feed grinder as a means of saving time and getting away from a tedious and often unpleasant job. When Mr. John Flessner told me more about it I decided to give electric grinding a trial. At his suggestion I ordered a hammer type mill with a blower attachment, as being most desirable for our power. We already had on the farm a portable five horse power motor which we used on the hay hoist.

## Power Company Cooperates

The Farm Service Dept. of the power company made the plans and helped install the grinder to make it as free from the need of attention and supervision as possible. We set the mill in a corner of the barn floor where it took up very little space. The barn is of the ordinary basement or bank-barn type. Hay and grain are stored on the second floor, where the grinder is located, while the basement is given over to stables and pens for the livestock.

## Elevate by Blower

We planned to use the blower on the grinder for elevating the whole grain into overhead storage bins, from which it would feed back by gravity. So we built three storage bins, holding about forty bushels each, above the grinder. Two of these are for whole grain, the third serves as a storage for the ground feed and as a dust collector. Each of the grain bins empties into a spout which has a shut-off slide. Thus the amount of either kind of grain can be regulated to get the desired proportions, and either can be shut off entirely. These spouts feed through a short piece of pipe directly into the grinder.

The ground feed bin has a chute so arranged that the feed may be run directly into bags, or into a bin in the granary, or through a trap door into the feed box in the cowstable below. The pipe from the blower runs across the top of the three overhead storage bins.

This pipe has cut-offs in it so that the grain can be diverted into the bin we want to fill.

When the grain bins need filling the blower on the grinder does the work. For a hopper to use when filling the bins, I had the local tinsmith cut a hole in the bottom of a large galvanized washtub. Into this he soldered a piece of four-inch pipe equipped with a slide to regulate the flow of grain. In filling the bins the washtub-hopper is put on a standard alongside the grinder with pipe running beneath the screen into the blower. The grain to be elevated is dumped into the hopper, the slide opened the right amount, and the blower drives the grain into the proper bin. This elevating, of course, requires attention to keep the hopper filled. But when I want to grind, I merely start the motor and open the slides in the grain chutes. As long as the grain continues to feed down, the grinding goes on without any further attention. Because of this automatic operation the mill does not require an attendant, and therefore the rate of grinding is not important.

So far, this method of grinding has been very satisfactory and surprisingly economical. When I first considered a grinder I had no thought of being able to grind for much less than the custom mill charge of 10 cents per bag. Careful readings of the house meter, however, indicate a power cost of only 2½ cents to 3 cents per bag. Also, it is frequently possible to grind on rainy or stormy days when a trip to mill would be out of the question.

## Advantages

There are several very definite advantages to this method of feed grinding which are especially important during this period of general depression. At such a time, facing shrinking or vanishing profits, shrewd and farseeing men in all lines of business are keenly interested in anything which promotes efficiency or cuts costs.

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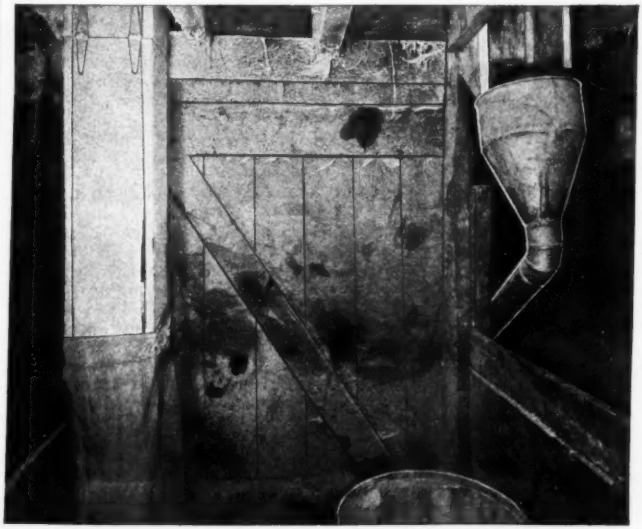


Layout of hoppers beneath grain bins on Lutz farm

# How The Motor Helps

By E. R. MEACHAM

**Preparing for next year's harvest**

IT had looked like snow all morning. We always expect a blizzard or two in January up in Wisconsin anyway, so I was not surprised to see a few flakes drifting across my windshield as I turned into the lane on the Thorson farm.

I stopped the car in the shelter of the barn and got out to look for Nels.

He opened the door of the granary and called to me to come over.

"I thought I heard your car," he said. "Come on in. I'm cleaning up some barley to take to the grain show next week."

"Who's helping you?" I asked, hearing the shake and clatter of the fanning mill going on behind him.

"The hardest-working hired man you ever saw on a crank," Nels grinned. "Step up and see him work."

I went up the steps to the granary and Nels pulled the door shut behind me. He was all alone in the room. The fanning mill stood in the central working space between the grain bins. It was clattering away at full speed, but there was no one turning the crank. In fact, even the crank was missing. But a quarter horse power motor was belted to a big pulley on the fan shaft—that was Nels' tireless hired man.

I stooped to examine the way the motor was mounted on the mill. About a foot from the floor on the side where there were no discharge spouts Nels had bolted two wooden brackets to the upright posts of the faninng mill frame. The brackets were simple enough. He had made them by sawing diagonally across a square piece of hard wood plank. On the brackets two boards formed a little shelf. And at the proper point on this shelf Nels had securely fastened a base plate for his motor. He had several of these plates so that he could move the motor from one job to another and set it just right for

# The Harvest

One wing nut fastens the portable motor to its base plate

each machine by tightening one wing-nut.

A quarter horse power motor drives a fanning mill just a little bit faster than a man could turn it, but because it runs steadily, not fast, or slow, as a man might do, it gives a more uniform product. Even so small a motor as this will easily run a sacker at the same time. This cuts down the work, and helps to keep the grain clean after it has been separated. In short, it cuts the job down from a slow, hard task for two to an easy one-man job.

"A good job for a motor," I said admiringly. "Did you get it just to clean up a few pecks of barley for exhibition?"

"I should say not," replied Nels indignantly. "A good lot of the grain in those bins goes through that mill. We used to crank it by hand to clean every bushel of grain we planted, but the last couple of years, since I've had the motor to do the work, I take the dockage out of all the grain I sell, too."

That is one of the little ways Nels Thorson is always finding to get more out of his crops. There are, if you stop to think about it, two distinct advantages in recleaning market grain right on the farm. The first is a better price. Clean, plump, heavy grain grades higher than a dirty sample, and if the dealer must reclean it, he naturally sets the dockage high enough to pay him well for the handling and for the loss in weight that will result from taking out the impurities. The higher price will often give a greater return from a few less bushels of carefully cleaned grain.

The other advantage is that when the cleaning is done at home the dockage remains on the farm for feed. Of course it will contain a lot of weed seeds, but if finely ground or fed to sheep they will do no harm. The dockage should be worth a good deal more as feed than it costs to remove it.

I do not know what Thorson paid for his fanning mill, but he did tell me that the motor cost $18.50. And I know from tests that have been made at several experiment stations that the cost for power to run a fanning mill is very low. One to two kilowatt hours will furnish the power to clean and sack 100 bushels of small grain.

Thorson reached into a bin for a handful of big plump oats.

"The best time to get the dockage out is before you plant the seed," he said, pouring the shining grain from hand to hand. "The biggest dockage expense comes from raising weeds with the grain. They cut down the yield, of course, and a careful study by the United States Department of Agriculture has shown that in some sections almost one-tenth of the cost of twine, harvesting, and threshing, was wasted on those weeds."

"It's a big job to get all of the weed seed out of the soil," I suggested.

"I know it is," agreed Nels. "That's no reason for replanting them every year, though. By rotation and clean cultivation, I can get rid of these weeds if I can keep from sowing a lot more. But there is another point that may be almost as important."

"What's that?"

"Running the grain over those sieves gives me a nice uniform lot to plant. The over-grown, misshapen, abnormal seeds, and the little undersized, shriveled ones are sifted out, and the blast of air from the fan blows away all the light, chaffy, weak stuff."

"My father used to buy shrunken wheat to plant, because he got more seeds to the bushel," I suggested.

"Yes, and your father thought he had to change seed every few years because his particular strain was running out, didn't he? The fact is, like produces like pretty exactly. If you want good crops you've got to sow good seed. It has always seemed to me bad management to spend anywhere from hundreds to thousands of dollars for a good bull or a good stallion and to give no attention to the selection of good seeds that will bring profitable harvests."

## Better Seeds—Better Results

Of course Thorson is right. Plump, uniform seeds are more apt to germinate at the same time, grow evenly and mature uniformly. A field that ripens all at once produces a better harvest because none of the heads have fallen to the ground before the laggards are in condition for binding.

Important as this is for grain cut with a binder, it is even more essential when a combine is used. Freedom from weeds is also important in combine harvesting because a large quantity of green weeds makes the grain difficult to thresh, and the weed seeds in the threshed grain are very apt to cause spoilage from heating. Even if cut with a binder, clean grain can be stocked or threshed from the shock almost immediately instead of having to stay in the field until the weeds are thoroughly cured.

"But don't you change seed with your neighbors?" I persisted.

"Not just for the sake of a change," Nels replied. "Of course my neighbors have seen with their own eyes that the grain in my fields is adapted to conditions here, and they have kind of got in the habit of asking me for seed, and paying me a good premium above the market, instead of paying a really fancy price for something they don't know much about.

## All Cleaned

"With that motor on the old fanning mill I can clean up the grain about as well as any they can buy. And on the other hand, when somebody gets in a new pedigreed variety that the State College has proved to be actually better than our old standbys, I am as anxious as anybody to get some from him. But you can bet your last button, I don't plant it till this little feller has had a chance to shake and blow everything out of it that I wouldn't want in my foundation stock."

"In that way the little motor actually improves your harvest," I suggested.

"And that isn't the only way," said Thorson. "You know if you raise a good crop on new, clean land it makes awful nice seed for next year. But if you try to sow it just as it comes from the threshing machine it may be so full of little twigs and straw and heads that it won't go through the drill or seeder accurately. Did you know that a little motor like this is a big help in calibrating a grain drill?"

"I suppose it would save turning the wheel by hand," I admitted.

"Sure. It gets pretty tiresome by hand, so I never used to turn more than enough turns to equal a quarter of an acre. But with the motor I run out the grain for a full acre. That is easier to figure and I think I get a better check on the drill's actual performance.

## Adjusting the Drill

Every good manufacturer of seeding machinery tries to make drills that sow accurately according to the indicators. But there is enough variation in weight per bushel and size of kernel so the machines cannot always be right. As Nels suggested it is a simple job to calibrate or correct a drill for the grain to be sown. Then it will neither waste the seed nor give too thin a stand.

First jack up both wheels and let down the hoes or discs into their position for sowing. Also raise the end of the tongue to give the whole machine the position it has when at work in the field.

Second, find out how wide a strip the drill sows. This is the distance between rows multiplied by the number of rows the drill sows—not by the number of spaces. For the extra space is left when the drill is turned back across the field.

Third, there are 43,560 square feet in an acre. Therefore, divide 43,560 by the width of the strip (in feet) to see how *far* the drill must travel to sow an acre.

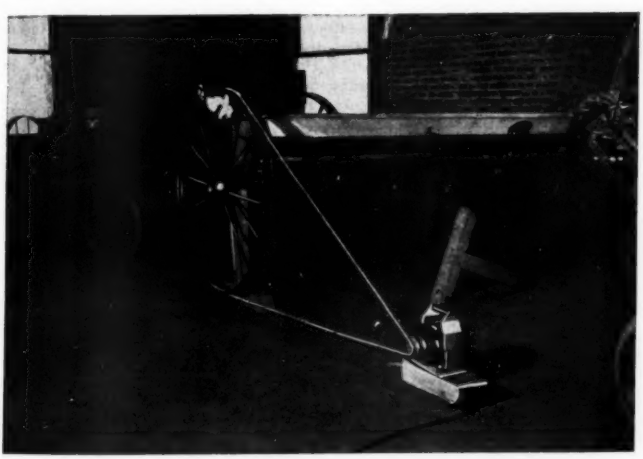
Fourth, when you know how many feet the wheel must go, divide that number by the distance *around* the wheel. That will show how many times it turns in sowing an acre.

Fifth, set the drill to sow just the amount you want in an acre. Fill the grain box with the seed you are going to sow and spread a canvas under the drill to catch the grain it delivers.

Sixth, mark the wheel so you can easily count the revolutions and turn it the number of times it takes to sow an acre. This is where Thorson found the motor so helpful. It did the turning while he did the counting.

Seventh, carefully weigh or measure the grain that came through on the canvas. If it

(*Continued on page* 24)



**Count the revolutions of the wheel while the motor does the work**

# SEED GERMINATING

## A Profitable but Inexpensive Practice with Electric Germinators

By E. W. LEHMANN*

NOW is the time to check up on getting seed germinated, if the best seed are to be available at planting time. Cost is always a factor, but a very small one when it comes to operating an electric germinator. The cost of electricity for testing seed corn is less than 10 cents a bushel, when electricity is secured on a heating rate. This cost is very slight when the value of a germination for detecting the health and vitality of the seed is considered. Men who do custom germinating usually charge from $2.50 to $3 per bushel for testing corn. It is readily seen that the electric energy costs for operating a germinator is a comparatively small part of the entire cost of testing corn.

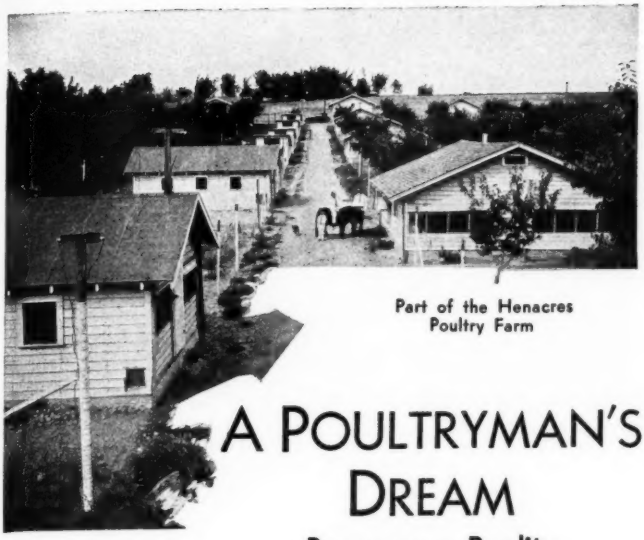
Tests carried on by the Illinois Agricultural Experiment Station indicate that the amount of electric energy consumed depends on the construction and insulation of the box and its location. A well-constructed box, properly insulated, located in a basement or any reasonably warm room, will consume very little electric energy.

*Farm Mechanics' Dept. University of Illinois.

In one test, a germinator with a capacity of 1600 ears used 34.4 kilowatt hours of electric energy during the germinating period at a cost of 6.4 cents per bushel, with electricity at a commonly encountered rate. This germinator box was located in an out building where some heat was supplied by a coal stove during the daytime. A test on a large germinator with a capacity of 14,000 ears used 495.7 kilowatt hours and cost 7.6 cents per bushel. This germinator was in an unheated building.

Another similar test on a small germinator with a capacity of 800 ears, operated with electricity supplied from a small unit plant showed a consumption of 10.96 kilowatt hours. This germinator was located in the basement of a residence, where it was quite warm, which accounts for the low energy consumption. The cost of operating this germinator was calculated on the basis of cost of fuel and oil consumed, and amounted to 18 cents a bushel. The actual costs of operating any germinator depend on the cost of electric energy per kilowatt hour.

Germination of seed may be considered as insurance of crop development. Like all insurance, its cost is comparatively low in view of the protection afforded. Home germinating of seed with electrical equipment is a relatively simple process, and the cost of current is a relatively minor item.



Part of the Henacres Poultry Farm

# A POULTRYMAN'S DREAM

## Becomes a Reality

By J. C. SCOTT

AMONG poultrymen of the Northwest, no one has made a more conspicuous success of his business than Mr. E. R. Wells, owner of "Henacres" at Prosser, Washington, First President of the Washington Associated Poultry Industries. Mr. Wells' business is to produce single comb White Leghorn baby chicks, pullets, and breeding cockrels of highest quality.

With an old automobile and $200 in capital, in 1915 he started a poultry business which has grown to where it is now bringing in $50,000 a year gross. But Mr. Wells had something besides an automobile and $200. He had a vision, a dream, and the courage and willingness to work hard under the most trying difficulties to bring his dream to realization.

### A Limited Start

He traded the car in as $500 first payment on a small farm, bought 100 hens for $100, and had $100 left for furniture, farming equipment and living expenses. He had no team or car, so carried his eggs a mile and a half to town and toted his groceries and feed home on his back. He bought a second hand incubator for $6.00 the first year, and two more small machines the second year. He then started supplying his neighbors with baby chicks, and later started shipping them to nearby towns.

### A Modern Plant

From this meager beginning, Mr. Wells has developed "Henacres" into a poultry plant second to none. It is neat. It is clean. It is modern in every respect. The buildings were not put up, one after another, with no thought of where the next one would be. Every building, every drive, every fence, and even every tree was located on paper before the ground was broken.

Included in the general plans were ways in which better chicks

could be produced with less labor by the applications of electricity and the development of new electric methods of raising chicks.

## A Big Chick Crop

The dream is now a reality. Twenty-five thousand chicks were produced in mammoth electric incubators last year. When the chicks come out of the incubators, those to be developed for pullets and cockrels on the ranch are put into electric brooders, and started out right with electric lights left burning all night.

Mr. Wells was one of the first men in the United States to use electrically operated mammoth incubators. He called upon the Company which manufactured his incubators to assist him to electrify one of his own for a trial. The Company first said it had never been done, could not be done, and was impractical anyway, but finally, after considerable urging, sent their engineer out to Prosser, where mammoth incubators were put into successful operation with electricity.

With the aid of electrically operated brooders, 1,200 chicks were raised up to three weeks in a space 10 ft. x 80 ft. during the past season. 200 chicks are put in a pen 4 ft. x 7 ft. outside of the hover. Some of the electric hovers are round and some are rectangular, 2½ ft. x 4 ft.

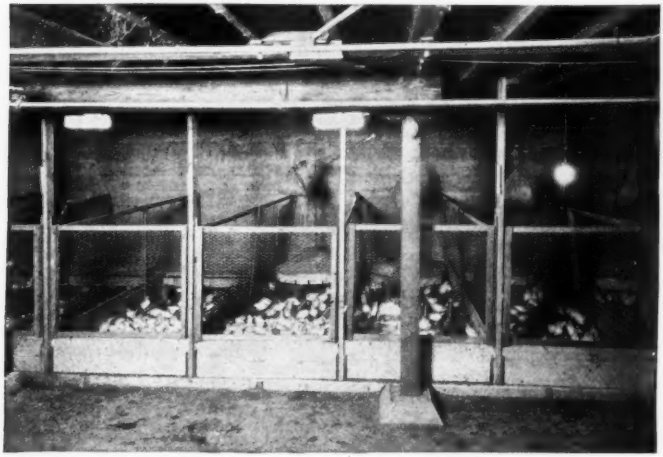
"We leave some current on all the time," commented Mr. Wells, "so the chicks will at all times have a circulation of fresh warm air. The chicks must be kept in extremely sanitary quarters, and we find that screen or hardware cloth lends itself admirably to this end.

"The lights are left on the baby chicks all night so they can eat or drink and see to make themselves comfortable without crowding.

"They are kept in these small pens for three weeks, then taken to the colony houses on the alfalfa range.

## Good Results the Reward for Modern Methods

"As to whether the chicks do well under this arrangement, judge for yourself. At three weeks, our average loss is 3½%, and at eight weeks, the cockerels average 1½ lbs., although they are White Leghorns and naturally small in size"



**Chicks are started here with electric brooders and all night lights**

The cost of installing an electric heating system in this greenhouse was less than a hundred dollars

## Automatic Heating For

# HOT HOUSE PLANTS

By WALTER V. WOEHLKE

E. L. CHAPPEL of Redlands, California, slept soundly every night this winter. Though there were two weeks in which the thermometer every night dropped to freezing and below, when a hundred thousand smudge pots lit up the orange groves in order to keep the frost wolf away, Mr. Chappel was not worried about the tender plants in his greenhouse; he did not put on his bath robe and slippers and brave the chill night air to see whether the heater was functioning properly. He knew everything was O. K. because electricity was on the job.

Instead of spending more than $400 to equip his propagating house with steam heat, Mr. Chappel listened to the industrial heating specialist of his power company and decided to give the electric current a trial. The installation of the system cost less than $100, including full automatic heat control. And it worked beautifully. Whenever the greenhouse cooled to a certain temperature, the faithful thermostat threw on the switch, current flowed through the wires, heated them, and they heated air and benches. As soon as the house was plenty warm enough the thermostat opened the switch again. All the while Mr. Chappel snoozed soundly.

The installation was amazingly simple. For the 75-foot house 1,600 feet of No. 12 iron weatherproof wire costing $10 sufficed. The wire was strung on the joists underneath the

benches carrying the young plants; fastening the wires on knobs required little time and skill. The wire was connected with a 220-volt, single-phase current, turned on and off automatically by a thermostat. The house was never overheated because the heat had not been turned when the sun came up.

The minimum of air currents was set up by this system of heating, thereby making the heat available in the immediate vicinity of the plants to be protected.

The current heated the iron wire to a temperature of 170 degrees and concentrated the heat where it was wanted and needed —on and around the bench.

The uniformity of temperature in every part of the house was a noticeable feature of the installation.

No supervision of the apparatus was necessary at any time, nor was the wire affected by moisture. The hose was freely used in all parts of the building.

It is expected that the use of electric current for greenhouse heating will expand very rapidly on the Pacific Coast because of the very low first-cost of the system, because of the simplicity and dependability of its operation and because the cost of the current, under Pacific Coast conditions, does not exceed the cost of other fuel.

## Laying Hens Need Water and Ventilation

One hundred hens, laying heavily, will perspire three to four gallons of water as vapor in a day. The non-layers will give off only half as much. This would indicate that not only is ventilation essential to maintain a dry house, but that drinking water of sufficient quantity and of the right temperature, is required. Not only is water essential to maintain normal body functions, but is just as essential to the formation of the egg as fat or protein, a dozen eggs contains a pint of water. With eggs at only 30 cents a dozen, a gallon of water in eggs is worth over $1.60.

**A simple, inexpensive and effective method of heating a greenhouse by electricity**

# The Romance of THE PUMPING PLANT

By HELEN COWAN

FOR almost five months there has been no rain in the valley. The irrigation canal at the border of the farm is bone dry. Plainly this is no country for green growing things—it should be a region of brown shrivelled grass and scampering desert creatures. Yet there is an orchard of splendid big trees, and a field of lusty alfalfa. And the trees which look limp after the hot day will be as fresh as ever by morning, for under the dry surface is soil full of moisture for their thirsty roots —even after five rainless months.

## The Heart of the System

In the corner of the field is the secret of the orchard's well-being: the pumping plant. Serenely humming its even song, pouring out a foaming stream of life-giving water, the pumping plant is a symbol of the fruitfulness of the West. Though streams dry up and skies remain cloudless, the land must still have water if crops are to grow. And the pumping plant in the little white shed under the transformer makes all the difference between the arid desert, and the crop-producing land of today. Here in the homely pump is the romance of the development of a new country.

## Egyptian Irrigation

Perceiving the great benefits from the water poured out over the land during the yearly overflow of the River Nile, the ancient Egyptians learned to pour water over the outlying land which the flood did not reach. For this purpose they first bailed up water from the river and emptied it out by the bucketful. In the course of time they developed a contrivance consisting of a pole with a bucket suspended at one end of the crossbeam, and a counterweight at the other end. By the use of this machine water could be lifted fifteen or sixteen feet on to the land above the river, and as much as four acres could be kept irrigated. Along the Nile today peasants may be seen working these simple machines tier above tier. Then came a crude wheel, around which runs an endless chain carrying small earthen pots. A great advantage in this appliance, is that animal power can be substituted for man power. In both Egypt and India this kind of a water wheel is operated by a bullock or two and waters 5 to 12 acres. Another type of machine used in India consists of a large leather bag hung on the end of a rope, the other end of which passes over a pulley and is fastened to a team of oxen. To operate the machine, the animals go up and down a slope just as long as the well is deep.

## Fifty Years' Growth

But in California, the irrigation has been going on scarcely fifty years, it has reached a state of perfection which is the example of the world—and the electric pumping plant is its symbol.

Early California attempted little in irrigation. The easy-going Spaniards, in a sparsely settled country where they could choose the acres most bountifully favored by nature, were content with the living made from their dry-farmed grain and from their cattle that fed on the wild grass of the best land. And it was not until the state had been thickly settled after the gold rush which brought in hordes of immigrants, that Californians began to turn their thoughts to more profitable crops

**Pumping Plants in Service on Opposite**

1. Primitive waterwheel in Morocco; note the wooden gear and pinit. Wate in rice field near Madras, India, operates pole and bucket by walking bak and f Egypt. This pump consists of water screw which lifts the water from irrigation ditc camel furnishes the power for hoisting the buckets. He walks down the excavat this point, the bucket is in the position shown. 5. A shaduf, or primitive pump, u This method of irrigation has been used in Egypt for thirty centuries. 7. Wate These productive acres were desert land not many years ago. 8. Interior of a ty

**Opposite Sides of the Globe**

Water is hoisted by fiber belt to which are attached buckets. 2. Hindu and forth on the upper end of a palm log. 3. A two-man pump in ion ditch into a smaller ditch on ground level. 4. In Tunisia, Africa, the excavated runway until he reaches the end, and can go no further. At pump, used in the Nile valley. 6. Another shaduf of the one man type. 7. Watering a thriving vineyard in the San Joaquin Valley, California. of a typical pumping plant in the California vineyard district.

locally to take the place of grain. During the seventies and eighties of the last century, the first experiments were being made in large scale irrigation, leading to the forming of large irrigation districts for the storage and distribution of the waters of streams.

Even with the great irrigation developments which were made all over the state, a great deal of land with dormant possibilities which were now realized, was still unreached. At the beginning of the century, a great variety of pumping methods were being developed to water this dormant land: windmills, gasoline or hot air engines, and steam engines were all being used. These were good only where the water level was not far below the surface—the cost of any great lift was prohibitive. And at this time the acreage supplied by pumping machinery was less than one per cent of that watered by gravity systems.

### The Genesis of Power

Near the beginning of this century, the first experiments were being made in a development which was to revolutionize irrigation in California—the tension of power lines into farming territory to supply irrigation pumps with electricity generated in hydro-electric plants of the mountains. One of the first serious developments in farm electricity was made in the San Joaquin Valley in 1899. Thirty years later electrical pumps totaling 725,000 horsepower are being used for farm irrigation in California—three-fourths of all the irrigation pumps used on American farms. And they water about two million acres.

In Egypt a brown-skinned peasant panted in the sun while he labored to keep four acres of land watered with his simple machine. In California a farmer throws an electric switch and a hundred acres of fine trees are irrigated by a power plant turning on a mountain stream a hundred and fifty miles away. This is the romance of the pumping plant which stands in the corner of the electrical farm—a romance of the development of men as well as the development of a rich new country.

## Motors Help Harvest

(*Continued from page* 15)

checks with the drill setting, the drill is correct for that particular grain.

Eighth, if the grain delivered is more or less than it should be, find the percentage of error and apply that percentage in changing the setting of the drill.

For example, suppose you have some large-berried oats and set the drill to sow 10 pecks per acre. But there are only 8 pecks on the canvas after the wheel has turned enough revolutions to cover an acre.

$10 - 8 = 2$

$2 \div 8 = \frac{1}{4}$ or 25%

That means the setting must be increased 25% to sow the desired amount. In this case setting the drill to sow 12½ pecks should actually result in 10 pecks per acre, for the first test shows that it sows 4/5 as much of these big oats as it should.

A lot can be done in the winter to improve next year's harvest.

## Chopped Alfalfa Hay For Pigs

Pork produced by feeding chopped alfalfa hay as a supplement reached a good marketable weight fully 17 days before the other pigs and was produced at a saving of 41 cents for each 100 pounds according to a recent report by the South Dakota Experiment Station. Twenty-five pounds of chopped alfalfa hay was used in a mixture with 50 pounds of tankage and 25 pounds of linseed oilmeal as a supplement to yellow corn. There was a saving of 16 pounds of feed for each 100 pounds of gain due to the alfalfa.

Since chopping or grinding alfalfa is resorted to where hay is artificially cured for feeding to dairy cattle, many feel that it should be even more worth while to adopt this practice for all classes of stock where natural curing makes it impossible to secure so high grade a product.

# Extra Switch Gives FIRE PROTECTION

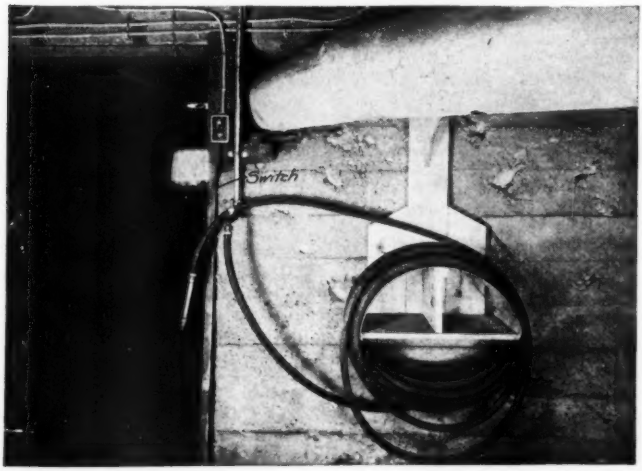
By GEORGE W. KABLE

OCCASIONALLY, in our travels, we see some device which we think worth telling other folks about. One of these was found last summer on the farm of Mr. John Miller which is being used as a demonstration farm by the Detroit Edison Company.

Mr. Miller has a pressure water system in his basement very much like those used on many other farms. This water system is provided with a pressure switch which starts the pump when the pressure gets down to about 20 pounds, and stops it again when it reaches 40 pounds. This makes a very satisfactory water system, but a little extra pressure would be desirable in case of fire. This is especially true if the pressure should happen to be down near the 20 pound point when fire started.

In order to obviate this difficulty, a switch has been installed in addition to the pressure switch. This switch starts the motor regardless of the pressure registered in the tank. In the illustration this switch is shown on the door frame just above the water faucet. It will also be noted that there is a three-quarter inch hose with a straight nozzle attached to the faucet and coiled up out of the way, but always ready for use. This hose is never uncoupled from the faucet and everyone knows it is ready for use in case of an emergency.

Should the emergency arise, the hose can be slipped off the support, the water turned on and the switch snapped in less time than it takes to tell it. There will be no waiting on the pressure switch and the little additional water when the fire starts may mean the difference between stopping it and not stopping it.



# ELECTRICAL HOUSEKEEPING

Conducted by GAIL MEREDITH

## Know Your Vacuum Cleaner

MOST of us are interested in getting our money's worth out of the new labor saving machinery we buy. But not everyone recognizes that the one sure way of doing it is to know all of the things that that machine will do, and to give it a chance to do them.

There are more things to know about a simple tool like a vacuum cleaner than many women realize. No two makes are alike, and each has some special feature it is nice to know about.

For instance, one of them lies down flat and goes under furniture like a mop, another has a detachable floor brush and a floor polisher. If a woman does not know that her machine will brush and polish, and crawl under chairs or if she did not learn how to put that brush and polisher on and take it off again easily, so she will do it regularly, she will come just that far short of getting her money's worth from that cleaner.

Some women do not realize that their vacuum cleaner can be used on bare floors to take up dust and lint. Some never remember, after they get the cleaner home, that there is a little lever that adjusts the nozzle of the vacuum cleaner at different heights. One position sets the nozzle close to the floor to clean bare floors or very thin rugs; the next is slightly higher and a third lifts it so it will clean rugs with a very deep, thick nap.

The other day I saw a woman turn off her cleaner, push it across the room, and rest the handle against the arm of a chair. While she was answering the telephone, I stepped over and looked at the little catch that holds the handle in place. It seemed all right. I tried it cautiously. The handle stood upright as it should.

"How did you do that?" she asked in pleased surprise as she hung up the receiver. "I'm always dropping that handle because I couldn't make it stand up."

Dropping the cleaner around is not good for the cleaner nor for the folks around who do not like noise. The lock catches the handle in different positions,—and there is no trick to using it, once you know how it goes—and I may add, that it is there.

Some vacuum cleaners have ball bearings. If they have, those bearings are packed in grease when the machine is made, and the machine does not need oiling. Others have one or two oil holes that need a drop or two every few weeks. Many of the troubles that send vacuum cleaners to the repair shop arise from the fact that women

forget to put oil in those little holes.

The other thing that frequently makes a woman complain that her cleaner will not work is a clogged bag.

This seems incredible, but a home service worker for a large electric company told me the other day that half of the vacuum cleaners that came to them for repair, had nothing in the world the matter with them but a dirt filled bag.

"You wouldn't dream that a woman could get so much dirt in the bag of a cleaner," she said. "They are literally packed tight."

Which just means that women have failed to realize that the cleaner is sucking up dirt on a constant stream of air. The dirt stops in the bag, but the air goes on through. Anything that cuts down that circulation of air, cuts down the work of the cleaner.

### Empty Regularly

To make sure that the bag is emptied regularly, a woman should know how to take it off and put it on. This is a perfectly simple job; she should learn to do it while she is buying the machine.

Sometimes the cleaner acts sluggish about picking up dirt because the brush is wound tight with hair or thread.

Then there are occasional women who use their vacuum cleaners once a week, never oftener, because they fear that too frequent use will hurt their lovely rugs. If you have ever had such an idea listen to this report on vacuum cleaning from the Good Housekeeping Institute:

"You need not worry about your cleaner injuring the floor coverings, even if they are Oriental rugs. We have not been able to detect any undue wear in our use of cleaners, and we have had no complaints to this effect from the thousands of housekeepers who have used vacuum cleaners for many years. As a matter of fact, we believe that the cleaner, rather than producing wear, will prevent wear by keeping the rug clean, and as we have said before, "it is the clean rug which wears longest."

* * *

## Lenten Sandwiches

MY cousin Jane has five lunch boxes to pack five mornings out of every seven. She says that the sixth day seems like a holiday for there are only two to pack on Saturday. In the course of the years she has been sending her family off to school and work with a dinner pail in its hand, she has discovered a good many things about sandwiches.

### Sandwich Fillings

"Some folks think a slice of cold meat is the only sandwich filling there is. But that is not half true. I have a little card tacked on the back of my recipe file that has fifteen good sandwich combinations on it. I can vary them still further by making them sometimes of white bread, sometimes of whole wheat, and sometimes of rye. That list always comes to the rescue when my invention flags, and I can't think of anything new for the lunch boxes."

Perhaps you would like to look at that list yourself. It begins with that most excellent meat substitute, cheese. Each of the four cheese combinations is really two. Jane points out, because you can use either ground or grated American cheese or cottage cheese.

½ cup cheese, 1 slice cut green pepper, salad dressing.

½ cup cheese, 4 olives, 1 stalk celery, salad dressing.

½ cup cheese, ¼ cup peanuts, salad dressing.

½ cup cheese, ½ cup figs, salad dressing.

Next come eggs. The egg yolks in the first sandwich are cooked when Jane makes angel food, and stored for sandwiches.

Egg yolks crushed, seasoned, moistened with salad dressing.

Hard cooked egg chopped with pickles, green pepper.

Then there are sandwiches made with fish. Jane uses salmon, tuna fish, or shrimp, whichever she has on hand.

1 cup fish, celery, pickles, salad dressing.

1 cup fish, diced apples, chopped cabbage, salad dressing.

Two on her list are made with vegetables. ½ cup ground carrots, ¼ cup raisins ½ cup peanuts, salad dressing.

1 cup cabbage, celery, lettuce, chopped, salad dressing.

The other five sandwiches will take the place of cake or cookies because they are sweet.

1 mashed banana, 6 dates, cream.

6 dates, ¼ cup nuts, salad dressing.

¼ cup figs, ¼ cup dates, soften with orange juice.

½ cup steamed apricots run through grinder twice with ½ cup nuts, soften with orange juice.

¼ cup raisins, ¼ cup dates, ¼ cup peanut butter, salad dressing.

## • OUR NEIGHBORS •

### Roosters to Russia

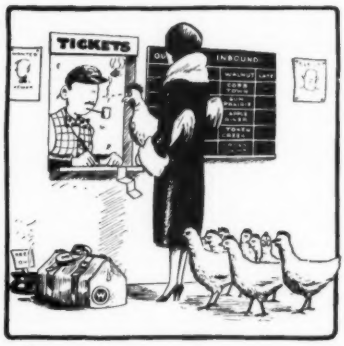
MISS JOHNSON really has nothing to do with chickens in the ordinary run of things. She teaches in the vocational school at Madison, Wisconsin. Late in 1926 she decided that she would like to spend her next vacation in Russia, and that brought her and the chickens together.

When she first spoke of going, her friends sent up a chorus of protest.

"Why you can't go to Russia, nobody goes to Russia."

"Nonsense," retorted Miss Johnson. "Of course somebody goes to Russia."

"How will you get in? You can't get a passport to a country we do not recognize."




Miss Johnson didn't know herself, but she set out to discover. Asking them seemed the simplest thing to do, so she sat down and wrote to the Minister in Charge of Foreign Affairs. She told him that she would like to visit Russia and see their work in education. She told him how long she would like to stay and where she wanted to go. She brought in the fact that she had done three years of war work in Europe with the Quakers; she mentioned everyone she knew whose name might be recognized with respect and then she sat back to wait.

She waited through November and December. She saw January and February torn off the calendar. March came and went. In April she had to admit that the prospect of going was slight. Then, early in May, a cablegram was telephoned her between classes.

"Visa meets you in Berlin."

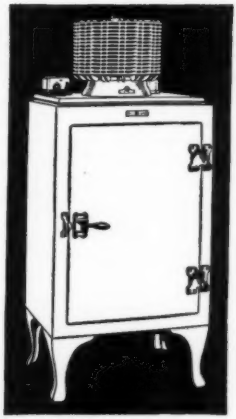
And close on its heels came another.

"Bring two roosters and eight hens. Best standard Leghorns. Good birds urgently needed. "Douchakoff."

You cannot start out to Russia with a couple of roosters and a flock of hens in a gunny sack, Miss Johnson recognized that, though she was to consider the idea later in desperation. So she set about discovering how they could go. She began by asking the Poultry Department at the University.

20 MILES TO TOWN

# WHEREVER YOU LIVE—*sure* PERFORMANCE AND SAVINGS



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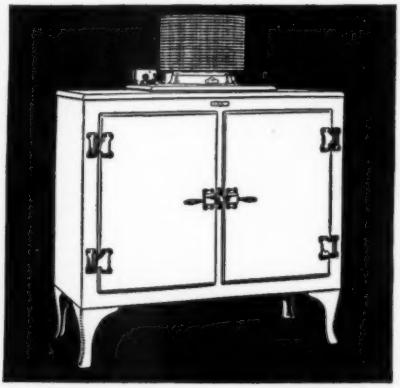

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"How do you send chickens to Russia?"

"We don't," replied Professor Halpin.

"How would you if you did?" persisted Miss Johnson.

"We wouldn't."

Then Miss Johnson told him that her welcome in Russia apparently hung on the successful convoy of two roosters and eight hens, needed, she guessed, in the famine-swept inland provinces.

Mr. Halpin was sympathetic but not helpful.

"What would you do?" insisted Miss Johnson.

"Cable them you're not coming," counseled Mr. Halpin.

But he could not stop Miss Johnson that way. She tried the express companies; she called the freight offices. But no one at any of them knew how to send a hen to Russia. She decided to begin with the hens.

"What does a Standard Leghorn cost?" she asked her friend Howard King.

"Ten dollars."

"If I bought eight hens and two roosters from you, it would be up to you to deliver them, wouldn't it?"

"Sure, I'd deliver them, Marge."

"All right, I'll take them."

"Fine. Where do you want them sent?"

"To Moscow."

But even a man who thinks nothing of shipping Standard Leghorns to South Africa or Australia, did not know how to get a flock of chickens into Russia.

## Futile Suggestions

All of Miss Johnson's friends were interested by this time. They were rich in theories of how it might be done, but somewhat vague when it came to practical suggestions.

"You might take them as excess baggage, Marge," said one. "You know, you could travel third class and keep your chickens right with you."

For a time she considered doing it, but someone pointed out to her that she would be stopped at the frontier of every country, that her birds might be quarantined for six weeks and perhaps refused admission altogether. So she gave up the idea of a personally conducted tour. She considered shipping them to Berlin, meeting them there and flying with them to Moscow.

"No, no," said Howard King. "That will never do, these birds aren't air-minded. You can't fly with them."

Then she gave that up too.

About this time someone discovered the Amtorg, a shipping concern that deals with Russia and worry over the hens ceased.

But when Miss Johnson went into their office in New York and asked them how she could send a crate of chickens to Russia, they were not at all anxious to do the sending.

"Why do you want to take chickens to Russia?" they asked.

"Because they want them," replied Miss Johnson.

"Because who wants them?"

"The Soviet," returned Miss Johnson emphatically pulling out her cablegrams.

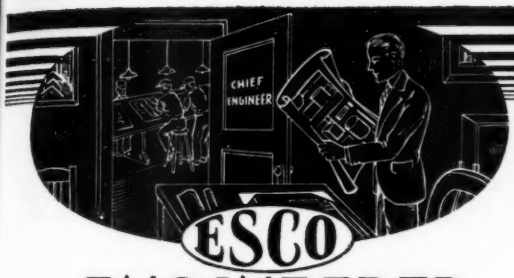
After much consultation, much

## COME ON—

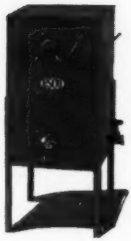
### Don't Be Bashful!

If you know of some farm woman whose story would interest the readers of Our Neighbors column, don't **be bashful—write me about her.** Give me all the interesting facts you know. A picture of her or her activities if you can procure such will be much appreciated.

GAIL MEREDITH




# ESCO
# *ENGINEERED*
## *Electric*
# MILK HOUSE EQUIPMENT



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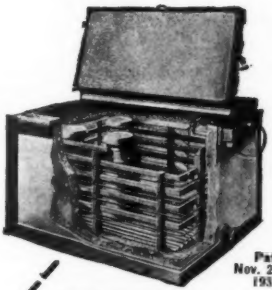

Pat. Nov. 25 1930

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"The STANDARD of the BETTER DAIRIES"

shaking of heads, and in spite of many misgivings, they decided to sell her the passage for eight hens and two roosters at five dollars a piece.

"Then there will be ten dollars for the floor space for their crate, and a—er—little for the steward who carries them water."

Miss Johnson reached in her purse for the money.

## Some More "Red Tape"

"There is another thing, Madam," said the clerk. "You will have to sign a statement relieving us of all responsibility for them."

"Certainly."

"And you must have their lives insured."

"Insured," snorted Miss Johnson. "I never heard of anything so silly."

"You never heard of sending chickens to Russia either," countered the clerk.

"Who on earth would insure a hen?"

"There is Lloyds."

So Miss Johnson got in a taxicab and rode up to the office of that great London Company. She went in with secret misgivings, but outward calm. She picked out a genial looking man and asked him, "Do you insure chickens?"

He stopped tapping on the counter with his pencil, but there was only a fraction of a second's hesitation before he replied.

"We—will."

While Miss Johnson was catching her breath with relief, he added,

"Of course, we must have a physical examination."

But the hen had already passed their physical examination and Miss Johnson had the State Veterinarian's report right in her purse. The man looked it over carefully and said,

"Very well. How much are these hens worth? The insurance will cost $7.00 a hundred."

So Miss Johnson took her ship to Italy and the eight hens and the two roosters started out from Madison to catch a merchant ship for Leningrad. At Rome there was a letter from Mr. King telling her that the birds had started out well and happy.

When she got to Berlin, delays over credentials held her longer than she expected and she began to worry for fear the chickens might get to Leningrad before she did and be lying in some forgotten spot choking for water.

So she wired the superintendent of the docks. "Have chickens arrived?"

With commendable promptness came the reply. "Chickens unknown, where, when, why and to whom sent?"

To which Miss Johnson replied, "Sent to me, water till I come."

She got to Leningrad on Saturday when everyone was off duty and she could find no one to take an interest in her chickens. But Monday morning early she found them. They were in excellent spirits and reports following them said that they had laid regularly all the way over, some days eight eggs. And, as Miss Johnson feelingly points out, you could scarcely ask more than that of eight hens on the high seas.

## A Little Service

The next step was convincing the puzzled superintendent of the value of these chickens. That meant telling the story all over, enriched at this last telling by much flourishing of pedigrees, insurance papers and cancelled steamship tickets.

The man was awed. "But what shall we do with them, Madam?"

"Do with them," cried Miss Johnson, "send them with a special courier to Moscow at once."

"You want a special courier to take them there?" he gasped.

"Exactly," she insisted.

He agreed to do it at once. Leaving nothing to chance, Miss Johnson went down to the station herself that night to make sure the chicken got off. There they sat, their crate on the floor of a compartment all for them, with a very important looking man sitting straight and stiff beside them with words that meant "special messenger" on his cap.

Now, she felt, the chickens were really in Russia.

*5 Horse Power Century Portable Power Unit*

## Stands Firmly
### On a Solid Foundation

The Steel Foundation and Crank Operating Screw Belt Adjuster gives this Portable Unit all the advantages of a permanent installation. The Belt Adjusting Screw—an exclusive Century feature—provides for correct belt tension. The Anchor Bar operated by the screw, adjusts the belt tension and is the only anchor required . . . Furnished with either single, 3 or 2 phase motors in standard, 3, 5 and 7½ horse power sizes.

CENTURY ELECTRIC CO.
1806 Pine St. St. Louis, Mo.

*40 U.S. and Canadian stock points and more than 75 outside thereof*

Century MOTORS

# The Green Knight

## PAUL WATER SYSTEM
*New Low Price!*

$75

**THE Paul Green Knight Water System provides the wonderful convenience of an *unfailing water supply, instantly available,* for the kitchen, laundry or bath! Mighty satisfying too—to have plentiful water, with adequate hose pressure, for sprinkling the lawn, fire fighting or washing the car.**

**THOUGH miles removed from city water facilities, you may, by the installation of a Paul Water Supply System, *enjoy the same modern bath, laundry and kitchen convenience as your city neighbor.* Best of all, you can enjoy this Water System while you pay for it. Only a small amount down and 12 small monthly payments buys it. *Write today for more details.***

***Sold on Easy Payments***

**FORT WAYNE ENGINEERING & MFG. COMPANY**
***Fort Wayne, Ind.***

*Pumps and Water Systems* — *Water Softener Heaters*

**Ft. Wayne Engineering & Mfg. Co.,**
***1722 N. Harrison,* Ft. Wayne, Ind.**

**Send complete information and prices on Paul Green Knight Water System . . . and Easy Payment Plan.**

*Name*.....

*Address*.....

THE PRACTICAL, ECONOMICAL

# ELECTRIC BROODER

## Makomb De Luxe

Electricity as used and controlled in this finer brooder is practical, economical and convenient beyond any previous conception. This unit provides both **Circulating** and **Radiant** heat — 100% satisfactory in every detail. Positive automatic temperature control. No pitting, arcing or radio interference. No wiring in canopy. Heavy insulation conserves heat. The element is guaranteed. Legs adjustable from 7 to 10 inches. If you have electric power don't fail to write for the facts on the Makomb De Luxe Electric Brooder, and the complete catalog of Makomb Poultry Equipment.

# MAKOMB

**Poultry Raising Equipment**

**GLOBE AMERICAN CORPORATION, KOKOMO, INDIANA**

*"World's Largest Manufacturer of Brooders"*

The LAUSON

## Electric Jacks

This No. 2A furnished with universal mounting bracket to accommodate motor, one you have or we will furnish, with V pulleys and V belt for drive.

The No. 2B has flat face pulley for drive from remote motor.

Also the Standard No. 3 with motor direct-geared in enclosed housing.

No. 2A with Belt Drive

**Full Line Complete Water Systems**

**Write for literature on either or all**

**The Lauson Corporation**
**700 Michigan, New Holstein, Wis.**

## Alternating and Direct Current Motors

Truly an indispensable hired man is the Fractional Horse Power Motor—Use it on the pump, fanning mill, feed grinder, tool grinder, freezer, meat chopper, washer, and many other applications.
Cost is very nominal, operate economically, give long service.
Demand Marathon "OK" Motors upon appliances that you buy. They will insure you long and satisfactory service.

**MARATHON Electric Mfg. Co.**

Box 440,
WAUSAU, WISCONSIN

# Front Cover Title Contest

## First Prize for January—$25.00

"The New Year makes a sweeping stride
To have all things electrified."
Mattie B. Dye, R. 4, Barberton, Ohio

The following titles have been selected as winners of the $5 cash prizes:

"Little New Year your spurs are not needed, when your steed is electrically speeded." Mrs. R. L. Benson, R. 4, Conneaut, Ohio.

"New Year bids you sweep aside, Old ways by which your hands are tied, and have your farm electrified." W. M. Whitman, R. 1, Wrentham, Mass.

"New Year so bright and alert, uses electric power to 'round up' the dirt." Cyril G. Whitman, R. 3, Box 124, Oshkosh, Wis.

"The year arrives on shining steed, to do your work with lightning speed." Chas. H. White, R. 6, Cortland, N. Y.

"When the New Year rides into the light of day, an electric cleaner will clear the way." Mrs. Geo. Harbert, R. 4, Bloomington, Ill.

## Rules for March Contest

For the best title to this month's front cover illustration, a cash prize of $25.00 will be awarded.

In addition, we will pay $5.00 for each of five titles given honorable mention.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

The winners will be announced in the May issue.

Only the farmers or members of the farm family, to whom this magazine was sent, are eligible.

Only one title may be submitted.

Use the form below or write your answers on a plain sheet of paper in similar form.

Contestants must answer questions (a) and (b).

Write plainly and send your suggestion to the Title Editor, ELECTRICITY ON THE FARM, 24 W. 40th St., New York, before April 1.

My title for the March Front Cover picture of ELECTRICITY ON THE FARM is....

.....

.....

.....

.....

(a) What members of your family read ELECTRICITY ON THE FARM?.....

.....

(b) Which type of articles do you find of most interest?.....

.....

.....

.....

Name..... R. F. D.....

Post Office ..... County..... State.....

# Questions and Answers

Conducted by
H. J. GALLAGHER
Agricultural Engineering Dept.
Michigan State College

Note—Readers are invited to send in questions which will be answered in the order received.

**Question:** *I would like to know if a one horsepower motor would pull a six inch burr feed grinder. I have read an article in* ELECTRICITY ON THE FARM *by you in the September issue of* 1930 *in which you showed on page* 19 *a picture of a one horse motor running a similar mill.*

*What is the make and the size of the mill you showed in the picture? My mill is an International Harvester. I would appreciate the information very much. I might add that shelled corn and oats would be ground on this mill for dairy cows and poultry.*

ROLLAND E. MAXWELL,
Urbana, Illinois.

**Answer:** A one horsepower motor will run a six inch burr mill. The article you refer to in the 1930 September issue of ELECTRICITY ON THE FARM illustrates a No. 6 Letz burr mill operated by a one horsepower motor. This installation has now been in operation nearly three years. The installation was experimental to determine the extent to which small motors could be used on a practical basis. Ordinarily a six inch burr mill is classed as a five horsepower job and it is when the mill is operated at capacity. A one horsepower motor and No. 6 burr mill grinds at the rate of about 100 pounds of grain per hour (medium coarse). Smaller motors result in slower operation and less capacity. I would not generally recommend this combination as too large a percentage of the power developed is required to run the mill empty and the feed adjustment must be carefully regulated or else the motor is easily overloaded. A more practical application is with the five horsepower motor providing enough grain is ground to warrant the expense or there are other uses for the five horsepower motor.

For a stationary installation where the motor would only be used for grinding, a two horsepower motor would be a practical unit. In grinding grain for dairy cattle the capacity per hour would be much greater than when grinding for poultry as the grain for dairy cattle should be ground coarse while mash for poultry should be ground fine. The finer the grain is ground the more power required. The sharpness of the burrs also determine the power required, as very dull burrs require fifteen times the power of good sharp burrs, which in other words means that the capacity of the mill is fifteen times greater with sharp burrs than with very dull burrs.

**Question:** *Why can the neutral wire of a three-wire system be smaller than the other two wires in connecting motors on 220 volt service but must be the same size as the other wires when the same motor is connected on* 110 *volt service?*

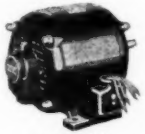
**Answer:** When motors are connected on 220 volt service the neutral wire is not a part of the circuit. Where the neutral wire of a three-wire system is smaller than the other two wires it may be used with either of the other two to provide 110 volt service providing the requirements of the motor do not exceed the carrying capacity of the smaller of the two wires. When a smaller neutral wire is used, it is to lower the cost of wiring. There is no objection

# A Highly Valued FARM AID!

MASTER PORTABLE FARM MOTOR

Master Guaranteed Motors are real farm helpers — built for difficult service — and cost no more than other makes.

A rugged, portable motor (3 and 5 H.P.) which saves time and labor on the heavier jobs such as sawing wood — filling silos — grinding feed, etc. Soon pays for itself.



MASTER MOTORS 1/30 to 10 H.P.

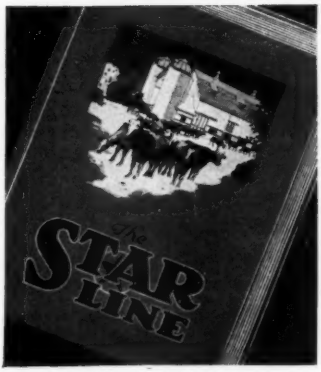
Then, you should have a Master Motor Grinder for sharpening all your tools.

Master Motors are made in sizes 1/30 to 10 H.P.—a motor for every kind of a farm job.

Write for full information.

**The Master Electric Company**
**Dayton, Ohio**

MASTER
*Guaranteed*
MOTORS
1/30 to 10 H. P.
More Than 100 Service Stations




# Right Now!

**Farmers Save Millions in Electric Ventilation**

***thru this***

# FREE BOOK

**and Special Starline Ventilation Bulletin!**

NOW you can learn free how to make a low-cost electric ventilation system revolutionize animal health and increase production of milk and meat. No more foul, damp air that breeds disease germs. No more inefficient ventilation that supplies only partly fresh air, and chills animals in winter. Now Starline has developed a perfect ventilation system that is economical in winter heating, yet gives animals purer air and better health.

Get this free book and Starline Ventilation Bulletin now. Find out how Starline electric ventilation equipment saves money just as does every other piece of Starline equipment, which is fully shown in the Starline Book. Mail the coupon for them today.

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(Formerly Hunt-Helm-Ferris & Co., Inc.)
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STARLINE, INC., Dept. EL-2,
HARVARD, ILLINOIS.
Please send me the Starline Book and the Ventilation Bulletin. I am planning now to

☐ Build ☐ General Barn
☐ Dairy Barn ☐ Remodel
☐ Ventilate ☐ Poultry House

Name .....
R. F. D. No. .....Town.....
State .....

to this practice so long as the neutral is used on lighting circuits.

A common practice in wiring for lights and five horsepower operation is to use two No. 6 feed wires and a No. 8 neutral.

One hundred ten volt service requires larger wires to transmit the same amount of current the same distance as does 220 volt service.

## Easy Feed Grinding

(*Continued from page* 11)

Surely the most apparent and possibly the most important advantage of grinding by electricity is a very real saving in cost over the custom mill charge. This will in time pay for the grinder. Then there is the saving in time and transportation costs through not having to haul the grain to a mill. Because this grinder works practically automatically, little labor is required. Surely no manufacturer would load his raw materials, haul them several miles to be processed, and then bring them back again, if the same operation could be performed more cheaply and efficiently under his own roof.

With this mill it is possible to make alfalfa meal from homegrown alfalfa hay. The present scarcity of corn and the extremely low price of wheat make it desirable to substitute wheat in many rations. For economical feeding to most kinds of livestock, wheat must be ground, and the use of an electrically-powered grinder will help market the wheat at a better price than is possible if it is sold as grain. Doubtless other farmers have found many other advantages in such a mill; I have only attempted to set forth some of the reasons why I answer the question, "Does it pay?" with an unqualified "Yes."

## Farm Seeds and Weeds

More than 15 per cent of all seed samples analyzed during the past year at the Minnesota Seed Laboratory of the State Department of Agriculture were contaminated with from 1 to 3 per cent of the primary noxious weed seeds These included such dangerous and destructive plant pests as quack grass, saw thistle, Canada thistle, dodder, leafy spurge, buckhorn and ox-eye daisy. The total extent of the contamination with all weed seeds was much greater.

Farmers purchasing from seedhouses are usually careful about their purity, but where seed is procured from their neighbors or when homegrown seed is sown, they may not realize the trouble they are making for themselves later on by sowing impure seed. New type recleaners on grain separators and combines are able to eliminate much of the weed seeds and should be universally used. The fanning mill, correctly adjusted and run at the required speed, offers a way to get clean seed and requires but little labor, all of which can be taken care of before the planting season.

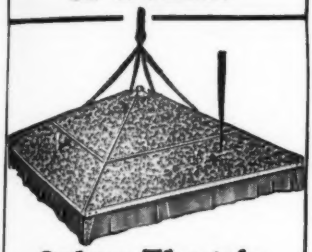
Nearly every state has a seed laboratory which will test a limited number of samples of seed at a small cost or in many cases free of charge. A sample which is to be submitted should consist of at least a cupful of seed made up by taking small amounts from several parts of the bin.

## Pipe Underground

Winter weather and frost mean trouble for overhead water lines. It is better to bury such pipes below the frost line, interconnecting the house, barn and pump with a planned water distribution system.

The pipe may be laid directly in a trench, though many prefer to first lay a line of cemented sewer tile and then run the pipe through it, using lengths that permit uncoupling in the cellar. This latter system has several advantages. The pipe can be removed thru the cellar for repair or replacement; one digging up of the lawn ends that bother, electric power for the barn or pump may be run from the house through this same tile line using non-metallic sheathed cable. With pipes and wires out of sight the appearance of the grounds is improved, and continuity of water and electric service insured.

## No ashes, fumes or trouble



## Oakes Electric Brooder

The Oakes Electric Brooder is fully automatic. Maintains even heat always. No crowding or smothering. No lamp or stove to take up space. No fire hazard. No danger of gassing chicks. Saves work, worry, time. Five sizes: 100 to 1000 chicks. Write for catalog.

**The Oakes Mfg. Co.**
Dept. 77, Tipton, Ind.

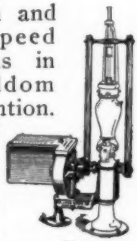
---

## Cullman Electric PUMP DRIVE

**Operates at Below Zero Temperatures**

The motor and power transmission are completely protected against zero weather.

The chain and sprocket speed reducer runs in oil and seldom needs attention.



Cost of operation is unusually low because of the patented load equalizer.

Write for folder.
**CULLMAN WHEEL CO.**
1342 Altgeld St., Chicago, Ill.

---

## High Pressure means plenty of WATER Everywhere

High Pressure means it isn't necessary to turn off the hose so that some one may take a bath. It means that every faucet and tap can be run at once.

For more than 30 years Kewanee has specialized in building High-Pressure Water Systems. They have proved their ability to provide many extra years of service.

200 models and sizes: 200 to 10,000 gallons of water per hour, from deep or shallow well, cistern, lake or river. Write

Kewanee Private Utilities Co.
464 Franklin St., Kewanee, Ill.

**KEWANEE**
HIGH PRESSURE
WATER SYSTEMS

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## Finest, Fastest Electric Clipper Ever Invented

*Universal motor for any 110 volt direct or alternating current.*

**STEWART Clipmaster**

It's the world's fastest. Has 100% reserve power. Is very light. Has perfect balance, with easy, comfortable grip in any clipping position. Quality built throughout. 25 feet of rubber covered cord plugs in any light socket. Fully guaranteed by world's largest makers of clipping and shearing machines. At your dealer's or sent direct; $2 with order, balance on arrival. Get catalog describing this and other models of world's largest line of clipping and shearing machines.

**$18.50**
*F.O.B. Chicago with strap handle; $19.50 with built-on aluminum handle.*

**Chicago Flexible Shaft Company**
5524 Roosevelt Road Chicago, Illinois

# Under The CHESTNUT TREE

### Deuces Wild

Parent (anxiously)—"Nurse is it a him or a her?"

Nurse—"It's a them."

---

"O dear, O dear. I dreamt that you had died."

"Don't cry, dear. Why let a bad dream upset you so? I'm still with you."

"Yes, I know, darling, but I was about to cash your insurance check when the alarm woke me and spoiled it all."

---

### Why Cows Wear Chains

Eighth grade pupils, taken on a trip to a dairy farm, were asked by their instructor to write a description of what they saw. One wrote: "The cows stand in long rows. They have chains around their necks so they cannot **set** while milking."

---

Oscar the Operator, when questioned as to why he unhesitatingly refers to his wife even in her absence, as his better half, explains that it's because he hears so much of "You better half this done" and "You better half that done."

---

### Shocking!

A farmer engaged the services of Weary Willie in exchange for lodging and board. All went well for a week or so, and then the farmer routed out the newly hired man about 3:30 one morning.

"What's up, boss?" queried the hobo, drowsily.

"Time to get up and go to work."

"What's the big idea?"

"We're going to reap."

"Reap what?"

"Oats."

"Are they wild oats?"

"Wild oats? Of course not, why?"

"Well if they ain't wild oats, why do we have to sneak up on 'em like this in the dark?"

Old Skinflint — "Here boy, what's this you were shouting? 'Great swindle—60 victims!' I can see nothing about it in this paper."

Newsboy—"Great Swindle—61 victims!"

---

Teacher: "Tommy, you ought not to be at school with your mother ill with diphtheria. She might give it to you and all the class might get it."

Tommy: "That's all right, miss. It's only me stepmother. She never gives me nothing."

---

### A Fowl Idea

"Ira, this is our twenty-fifth wedding anniversary; shall we kill a a chicken?"

"Why punish the chicken for what happened twenty-five years ago."

---

Scot: "Wha' dae ye charge for a haircut?"

Barber: "Eight pence, sir."

Scot: "An' hoo muckle for a shave?"

Barber: "Four pence, sir."

Scot: "Then gie ma head a shave!"

---

### Filtered

Two microbes sat on a pantry shelf,
And watched, with expression pained,
The milkman's stunts; both said at once,
"Our relations are getting strained."

---

The story is told about two men who, in the old days in the West, formed a partnership for the purpose of cattle "rustling," and operated together until they were caught by the Vigilantes' committee. The next step, of course, was a lynching bee, and the two thieves were taken to a bridge for hanging.

As the first one, with the rope around his neck, was cast off, the rope broke, and he fell into the river. Being a good swimmer, he swam downstream and escaped.

When the lynchers adjusted the rope around the other fellow's neck, he said:

"Boys, I wish you'd be careful with that rope. I can't swim a stroke!"

---

### You Can't Always Tell

The pet joke of a certain community was to offer a dime and a nickle to Jed, the town halfwit. The poor fellow always took the nickel, because it was larger.

One day a stranger, having been told about Jed, made the customary offer of a dime and a nickel. When Jed took the nickel the visitor asked him:

"Don't you really know the difference between a nickel and a dime?"

"Sure I do," answered Jed with a crafty smile, "but if I took the dime they'd never try me no more!"

# STOVER
## CORN SHELLERS
*ELECTRICALLY OPERATED*

HERE'S a corn sheller that will appeal to every farmer and feeder. Requires but 2 to 5 H.P. to operate. Shells from 50 to 75 bu. per hr. when run at 800 R.P.M. Handles husked corn in any condition—thousands use it for popcorn. Metal construction insures perfect alignment—prevents any warping or rotting. Ask your power company. Write for catalog and name of nearest dealer.

STOVER MFG. & ENGINE CO.
*Electric Driven Farm Machinery*
171 Lake Street, Freeport, Illinois

You can rely on our advertisers.
If they can't supply your wants
see Page 43 (inside back cover).

## NEW WAY TO CHURN

Thousands are changing to this simple, convenient, modern way to churn. It's the famous DAZEY principle adapted to electrical operation. Ends the drudgery. Just turn the switch. Made in 2, 4, 6 and 10 gallon sizes. Write today for catalog and further information.

DAZEY CHURN AND MFG. CO., Dept. 27
Werne and Carter Avenues, ST. LOUIS, MO.

## Andis Animal Clipper

THE NEW ELECTRIC

Fast—clips udders and flanks, 8 to 12 cows an hour. Weight only 3 lbs. No cables or stands. See dealer or write for full details.

ANDIS CLIPPER COMPANY
1642 LAYARD AVE...RACINE, WIS.

## BUY DURO NOW

And settle the water supply problem forever—only a few dollars down payment brings fresh running water under strong pressure, piped into your house. Makes possible water in the kitchen, bath, inside sanitary toilet, laundry, water for sprinkling, lawn and garden, live stock and chickens. Write for illustrated electric water system catalog.

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537 E. Monument Ave., Dayton, Ohio

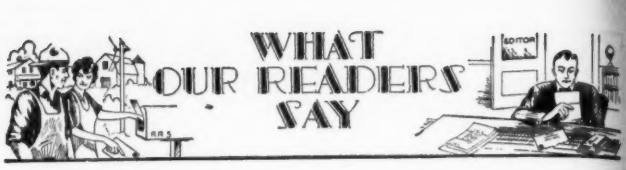
DURO
*Automatic Water Systems*

## MORE PROFITS
*from Chicks*

For breeders, poultry-raisers, hatcherymen—extra quality, extra profits in Petersime Electric Hatched Chicks. Petersime Incubators give unmatched results — lowest operation costs—built in five sizes from 1,400 to 15,984 capacities.

Write for NEW FREE Catalog.
No obligation.

Ira M. Petersime & Son
EF-33, Gettysburg, Ohio




## Most Serviceable

To me, my electric heater is most serviceable. My room upstairs is not heated by our furnace, so when dressing in the morning, it makes my room comfortable. It does not use much electricity, as our bill is not much more than before I had the heater.

I advise persons who have to be in a cold room upstairs or one that is not heated, to use the "electric heater," if they want to be warm and comfortable.

MISS HARRIET M. COOK,
R. 4, Marion, Iowa.

• • •

## The First Blessing

Running water from the well to the house has been my greatest servant, because it has saved me all kinds of hard labor in all sorts of weather. I had to go seventy-five feet from the house to the well, in snow, rain and sleet, to bring water for household uses, including washing for a family of nine. Sometimes the pump was frozen and had to be thawed out. As soon as the electric line went through water installation was the first blessing that entered our home.

MRS. MARY J. WILCOX,
R. F. D. 3, Putnam, Conn.

• • •

## Blue Mondays Banished

In former days before electricity, wash days were a drudge. Now with my electric washer "Blue Mondays" have turned to sunshine.

I can do twice as large a washing in one-half the time it took me to do the small washing by hand. By noon the snow-y-white clothes are all on the line, much whiter than if it had been washed by hand. With this servant when the wash is on the line I feel as fresh as when I started. Before I always had to lie down and rest when I finished.

Those who do not have this one to help them do not know the joys of washday. I am sure the farmer's wife should enjoy the electric servant as well as those in the town and cities.

MARGARET A. CHASE,
R. F. D. 1, Houghton, N. Y.

## An Everyday Servant

Being a business woman in a small town and with limited time for meals, it was my experience for years to spend part of my lunch time in hunting the dilatory ice man. No longer do I have this annoyance, as I now have an electric refrigerator which serves me well day in and day out.

It is necessary to buy much of the perishable food — meats, fruits and vegetables—that we use in a near-by city. This is no longer a problem, since I can now buy a week's supply at one time. This means much to me personally, as I can now plan all my meals well in advance.

MISS KATE HARRIS,
Leesburg, Ga.

• • •

## Another Problem Solved

At slight expense I converted the storage building of a pioneer flour mill into an electrically-operated elevator with capacity ample to care for the grain produced on my farm. The operating cost is practically negligible. It furnishes storage until the market is favorable. The ease of operation reduces labor and management problems in the midst of harvest. Here, electricity provides facility of operation that no other power could. My elevator is a unique piece of construction, an infrequent type of farm equipment and a servant that I highly prize.

W. M. ECKEL,
Douglass, Kan.


## CLASSIFIED ADVERTISING

The LYON ELECTRIC COMPANY manufacture electric poultry equipment exclusively. Long, practical experience in the highly developed California rural electric field enables us to furnish quality devices at reasonable prices. The LYON line includes: Brooders—Incubators — Egg Testers — Burglar, Temperature and Power-off Alarms — Heating Elements—Thermostatic Supplies—Time Switches—Wiring Supplies. Write for catalog today. LYON ELECTRIC COMPANY, 2075 Morse Street, San Diego, California.

MERCHANDISING SUPPLEMENT
Electricity on the Farm

Vol. 4 MARCH, 1931 No. 3

**Approved Equipment for the Farm**

Under the auspices of the Farm Equipment Committee, National Electric Light Association, a list of electrically operated farm equipment which has been proven satisfactory in actual operation has recently been compiled. This list makes available to members of any farm organization, public utilities, or, in fact, any organization desiring it, the names of those concerns who manufacture equipment that has been found to be fully satisfactory for use on farms.

The compilation of this list has accomplished a great deal in clarifying the question of dependable and suitable electrically operated farm equipment. It now makes possible the recommendation by a power company to their customers of equipment which has proven itself. It weeds out those concerns who have yet to determine by sufficient trial the satisfactory performance of their equipment.

The committee intends to keep the list thoroughly up to date by additions or deletions as reports warrant. The compilation is a cooperative production of power company rural service representatives, college instructors, and farmers, and such may be expected to reflect accurately the opinion of those who use, install or supervise electrified farm equipment. The list is by no means final, nor complete, and many changes may be expected from time to time. A good start has been made, and a real service done to the farm electrification movement.

The "Salesmobile" or salesroom on wheels used by the Malone Power & Light Company

## Disregard of Slumps and Seasons Made Joe Dwyer

# A STAR SALESMAN

By GEORGE W. PRING

"HARD Winter! Did you ever see an *easy* winter?"

When Joe Dwyer puts that question to a hesitant rural customer, he sums up a sales philosophy that has made him the outstanding rural salesman of the Malone Light and Power Company, northernmost member of the Niagara Hudson Power System.

They do have hard winters in the far-flung rural section of Northern New York which Joe's company serves. Hard, yes, but somehow during the first four months of 1930 Joe managed to sell $12,329.16 worth of rural merchandise. His record during the month of March, for instance, shows that Joe sold twenty-six washers, three domestic refrigerators, three milking machines, one electric range, one commercial refrigerator, three wiring jobs and some other incidental sales to bring his month's total to $4,785.58.

Joe's total sales for the first nine months of 1930, the beginning of the so-called "depression period," were $22,958.08. That was exactly $4,961.82 *more* than his total of $17,996.26 during the same period of 1929.

These figures are undisputable evidence that Joe's sales methods bring very tangible results. Joe does not operate alone in a compact rural region. His territory is limited to 1,100 meter cuscustomers, scattered over an area including twenty-six hamlets and villages.

### Know Your People

Though the results of Joe's efforts are extraordinary, he does not consider his methods unusual. Nevertheless, some of his epigramatic sales points might well be tacked on the dashboard of many a rural salesman's car.

"Know your people." This is Joe's first maxim. Practicing it, he spends many hours and days in visits with no hope of an immediate sale. Large groups of the rural people in that section of New

York State speak French instead of English, so Joe has taught himself to speak that language fluently. He has the advantage of having been born and raised in the region, but he has capitalized it to the fullest extent by making himself known to every family in his territory.

## Another Precept

"Never try to be clever." That is another of Joe's precepts, founded on his keen knowledge of his people. Joe has found that the moment he attempts to be clever, or to "strut" in any way, he has made his prospects suspicious. Talk their language and tell your story simply and frankly, he says.

Joe thinks that many rural salesmen may disagree with him on this point, but he sticks to it: "If there is something about your product that you don't know, admit it." A salesman who attempts to cover up his ignorance of a technical point invariably betrays himself, Joe has found. A frank admission that the salesman does not know is more apt to build confidence in his sincerity than anything else.

Joe makes a special effort to impress his prospects with the value of the printed literature he leaves. He always requests that, as a personal favor to him, they keep it in a safe place. When he leaves a booklet, he writes on it in a conspicuous place—"Please do not destroy, I'll call for this later," and signs his name and telephone number. That literature is rarely thrown away and very often prospects have phoned Joe six months or even a year later and sale has been consummated.

Joe does not relax his sales efforts during the winter, but he finds it a period for building prospects for the spring and summer. It is then that he makes many social calls and leaves his literature, planting seeds that, with the warmer weather, will blossom into sales. During March, April, May and June of last year he sold over twenty thousand dollars worth of goods, and he attributes most of these sales to efforts made during the long winter when prospects were given an opportunity to read of and think over the purchase of electrical merchandise.

The afternoon and evening offer the best periods to make sales, he has found. The rural housewife is too busy in the morning to give much time to salesmen. Evening church suppers, meetings and social gatherings offer an excellent opportunity to establish friendships, even though no effort is made to sell at that time.

Volumes have been written about the method of sales approach. Joe outlines his as follows: "When I call for the first time on a new family in my territory, I never carry a sample case or even a brief case with me. I try to avoid looking like an "agent," and bring only such sales literature as I can carry inconspicuously in a coat pocket. I inform them that I am from the Malone Light & Power Company and, after a brief visit, ask them if they have such appliances as a refrigerator, electric iron, milk cooler, etc.; if not, I leave literature concerning those items and get permission to call again. I never rush a sale under any circumstances."

## "The Salesmobile"

Joe now has an opportunity to apply his sales methods in what, for that section of the country, is an experiment in rural selling. The Malone Company has placed him in charge of a fully equipped "Salesmobile," a veritable salesroom-on-wheels.

The Salesmobile is a standard Ford truck with a specially built body. When closed, the body has the dimensions and appearance of an ordinary closed truck. By the operation of a single mechanism, the sides and top of the truck can be extended and the vehicle becomes a compact salesroom, large enough to permit adequate display and demonstration.

The truck is furnished with such electrical appliances as a washing machine, automatic water system, dairy sterilizer, radio, vacuum cleaner, refrigerator, range, ironer, small farm appliances and a large number of small electrical utensils. An extension cord to the nearest

light supply furnishes the power necessary to demonstrate the electrical merchandise.

The Malone Company plans to use the Salesmobile in a house to house canvass of the entire territory, supplementing the salesman's efforts by bringing the merchandise to the farmdoor where it can actually be seen and examined. Lighting outlets are being placed in each of the villages in the salesman's territory so that the Salesmobile may be operated for public demonstrations.

The plan of the salesroom on wheels has been found especially valuable in demonstrations at community gatherings where a large number of people have an opportunity to inspect the merchandise.

A rural sales record that is worth studying because of the story it's figures reveal, is contained in the following record of Joseph Dwyer's sales during nine months of 1930. Mr. Dwyer is in the sales department of the Malone Light and Power Company, a unit of the Niagara Hudson system.

**JANUARY**

Six washing machines
One electric refrigerator
One domestic refrigerator
Two electric radios
Six wiring jobs
Total Sales.....$1,863.50

**FEBRUARY**

Two washing machines
Three domestic refrigerators
Two electric radios
Two wiring jobs
Total Sales.....$1,151.10

**MARCH**

Twenty-six washing machines
Three domestic refrigerators
Three milking machines
One electric range
One commercial refrigerator
Three wiring jobs
Total Sales.....$4,785.58

**APRIL**

Nine washing machines
Two domestic refrigerators
Eight milking machines
One radio
Sixteen wiring jobs
Total Sales.....$4,528.98

**MAY**

Ten washing machines
Three domestic refrigerators
Seven electric ranges
One milking machine
One commercial refrigerator
Twelve wiring jobs
Total Sales.....$5,577.02

**JUNE**

Seven washing machines
Seven domestic refrigerators
Ten electric ranges
Three milking machines

(*Continued on page S16*)

**Interior view of "Salesmobile" showing appliances carried for demonstration purposes.**

# RURAL ELECTRIFICATION Salesmen's Forum

## Milk Cooling

THE problem of cooling milk on the farm is not one which is the sole concern of the farmer but one which necessarily demands the attention of the utility company, which is to provide the electric energy to operate the equipment and the equipment dealer who may furnish the cooling machinery and tank or box or material from which to build either one. The place of the equipment dealer and utility man in the solution of this problem will be considered first and then followed by matters which are of primary importance to the farmer but which must be recognized by those who furnish him the power and the equipment.

The equipment dealer is naturally interested in the sale of equipment and the volume of sales which he may expect. He should also be interested in providing the farmer with the type of equipment which is suited to his needs, since various kinds of equipment are demanded by different types of installations.

### Two Classes

In general, types of dairy farm refrigeration equipment may be divided into two classes, one for the farmer who produces his milk and retails it, and the second for the one who produces it and sells it at wholesale or as sweet cream. In the second case the farmer dairyman usually sells all of his product daily and overnight storage only is required for the milk held in cans while the first man must provide storage for bottled milk which is carried over from one day to the next. In either case the man is interested in cooling his milk to a low temperature to prevent growth of bacteria, with the exception of the producer whose morning's milk is delivered at the milk plant within a short time after milking. For this reason, where possible to use brine or water for cooling milk, it is faster and far more satisfactory than the use of cold air, as shown in the results of experimental work conducted at Oregon Agricultural College. In tests conducted there, milk in 10-gallon cans, which had been reduced to a temperature of 67.5° F. over a surface cooler, was cooled but 3° F. in a room at 38° F., with an electric fan circulating the air, in two hours. In a similar test with milk at 66° F. placed in a tank in which the water was agitated the temperature was lowered to 41.5° F. in the same length of time.

### Methods and Costs Studied

The equipment which at the present time seems best suited for use on the farm which sells its milk in cans is an insulated tank cooled by an electric refrigerating machine and operated in combination with a surface cooler or as a complete unit in which all cooling is done in the cans after they are placed in the tank. In the spring of 1930 a study was made of the methods and costs of cooling milk on 113 dairy farms in New York State by the Farm Economics Department of Cornell University. Of this number, 101 were using electric milk cooling equipment and 12 were using ice. The cost per can of milk cooled with the use of ice averaged 13.7 cents while that for milk cooled with electric refrigeration was 11.4 cents per can with electric energy at 4 cents per kilowatt-hour.

Where a surface cooler is not used for precooling the milk placed in such a tank, experiments indicate that an agitator is particularly important in speeding up the rate of milk cooling. Tests con-

PURDUE UNIVERSITY, AGRICULTURAL EXPERIMENT STATION

**Rates of Cooling When Agitator Was Not Used in Milk Cooling Tanks**

| No. of Tank | No. Cans in Test | Temp. Cooling Water | —Minutes required to cool to— 60° F. | 50° F. | 40° F. | No. Tests Made |
|---|---|---|---|---|---|---|
| 1 | 2 | 40° | 75 | 195 | | 8 |
| 2 | 2 | 35 | 55 | 120 | 330 | 4 |
| 3 | 3 | 35 | 75 | 155 | 360 | 3 |
| 5 | 3 | 40 | 75 | 210 | | 4 |
| **Rates of Cooling When the Agitator Was Used in Milk Cooling Tanks** | | | | | | |
| 1 | 2 | 40° | 35 | 75 | | 6 |
| 2 | 2 | 35 | 27 | 49 | 165 | 6 |
| 3 | 3 | 36 | 30 | 65 | 375 | 3 |
| 4 | 4 | 35 | 42 | 65 | 138 | 4 |
| 5 | 3 | 37 | 29 | 60 | 480 | 5 |

ducted at Purdue University during the winter of 1929-30, published in the September, 1930 issue of "Agricultural Engineering," indicate that the time required for cooling similar amounts of milk by the same equipment has been cut in half through the use of an agitator. This saving in time is of particular importance since only two of the 101 tanks investigated in New York which have been previously mentioned, were using surface coolers and they were producing milk for a local market.

Tank number four could not be operated without the agitator so could not be included in top list.

Temperature of all milk entering tanks, 95° F.

## Rate of Cooling Important

It will be noted from the figures in the accompanying table that the rate of cooling in tanks without agitators is too slow in many cases to reduce the temperature to below 50° F. in two hours which should be done to prevent bacterial growth. The rate of cooling to less than 50° F. is particularly important for producers of Grade A milk who usually must cool their milk to that temperature within one hour when it is sold as raw milk. The use of an agitator may be advisable in a tank into which pre-cooled milk, that is milk which has been partially cooled over a surface cooler, has been placed. Figures reported by Oregon Agricultural College in tests with pre-cooled milk placed in an insulated tank without an agitator showed a temperature reduction of 15.5° F. in two hours from 67.5° F. to 52°, with brine temperatures from 36° to 39° F.

Obviously this rate of cooling would be too slow for the producer who must cool his morning's milk to less than 50° F. in a short time.

The majority of manufacturers of household refrigerating equipment now make machines to be used for refrigerating these tank type coolers. Several manufacturers of large refrigerating machinery have also entered this field with ammonia machines particularly designed for the purpose. In some cases the machine and tank are sold as a unit, in others each item is sold separately. The latter method is necessary in many installations since farmers wish to construct their cooling tanks. When this is done, it eliminates the possibility of the dealer furnishing both tank and refrigerating machine. On the other hand a goodly percentage of farmers will prefer to purchase the entire equipment required as a unit.

## Value of Insulation

The value of insulation in the cooling tank to the farmer has been given a thorough test by the New York State Agricultural Experiment Station. Heat losses on a concrete tank insulated with three inches of cork and on one with four inch concrete wells and no special insulation were made. As a result of this work, it is reported in Bulletin 581 of that institution that "The three inches of cork saved 212 pounds of ice in one day which at $5 per ton was worth

53 cents. If we assume similar losses for five months per year, the insulation saved $80, or three times its cost in one year. It should not be assumed that three inches was the best thickness of cork to use, but rather that thorough insulation was profitable."

Equipment which has been found to be most practical for the dairyman who retails his own product is a dry insulated box operated in conjunction witht a surface cooler. The storage capacity of the box should be sufficient to adequately accommodate an entire day's production in bottles or in cans which has previously been cooled over the aerator. Such a box may be cooled from a brine tank located in the top or side of it or by direct expansion. In installations where direct expansion is used, a brine tank is usually constructed outside the storage box for use in cooling the aerator. The brine is circulated by a small motor-driven pump from this tank through the lower half of a tubular cooler to lower the temperature of the milk below that which is possible by use of the water cooling alone, employed in the upper half. Where the brine tank is located inside the box, the brine in it is also generally used to assist in cooling the milk as it runs over the aerator. The milk is usually bottled shortly after cooling and is placed in cases and stored until ready for delivery although storage in cans is practiced to some extent.

## Must Be Built In

The storage box unlike the tank is seldom built at a factory, due of course to the difficulty which would be experienced in moving it from factory to farm. As a result, the farmer is practically required to have the box built in its permanent location. These boxes are of two types the "walk in" and "non walk in," which from their names can be immediately distinguished. The smaller boxes are

**A factory built tank such as this will help the dairyman reduce the bacteria count and produce a better quality product.**

usually of the latter type, and the larger most generally the former to permit of loading bottled milk in cases to be mounted on a truck and wheeled into the storage box.

The box is most often of frame construction for walls and ceiling with concrete floor, all of which are insulated on the inside with various materials depending upon the section of the country in which it is located. Many sizes have been reported from various State Agricultural Experiment Stations and many types of construction and kinds of insulation. Since bulletins are available from nearly every section of the United States, local situations can usually be best answered by referring to results of experiments conducted in that particular section.

Certain figures reported in Bulletin 495 of the California Agricultural Experiment Station on the matter of size of box and brine tank and thickness of insulation are valuable. It is stated that "A floor space of 15 by 15 inches should be allowed for each 10-gallon container that is to be stored. Where the milk is stored in quart bottle cases, a space 16 by 20 by 12 inches should be allowed for each case." For the size of brine tank "If the brine system is used the tank should contain from 1.5 to 2 gallons of brine for each gallon of milk cooled per day." The recommendation for insulation is that "The equivalent of 3 to 4 inches of sheet cork should be used for insulation of the brine tank or storage box."

## Refrigeration Versus Ice

Definite studies on comparative costs of cooling milk by mechanical refrigeration with cold air storage versus ice and water have been made in the New England states of New Hampshire, Rhode Island, and Vermont. Results reported from New Hampshire Agricultural Experiment Station in Bulletin 238 state that "The total annual costs show that the electric method ranged from 42 per cent to 60 per cent of ice refrigeration, the average being 50 per cent. The above indicates that from a general standpoint, operation by electricity, neglecting the superior qualities of mechanical refrigeration, was more practical and economical on these farms than with ice and by a considerable margin." Records have been kept of the cost and efficiency of cooling milk by ice as compared with cooling by the use of an electrically operated unit of the dry-storage type and reported by the Vermont Agricultural Experiment Station in Bulletin 300. The records "Reveal that if properly used both methods are efficient and satisfactory from the standpoint of quality of milk. If ice costs two dollars a ton stored in the ice house, there is little difference in cost between the two methods, but if ice costs three dollars per ton the mechanical method appears to be materially cheaper with electricity costing 5 cents per kilowatt hour. If the electric rate is lower the mechanical unit has a still greater advantage. The electrically operated milk cooler appears to be adapted to and economical for use on Vermont dairy farms and increasingly so on farms located in regions where ice storage is less feasible than it is in Vermont."

## Rhode Island Results

It is reported by the Rhode Island Agricultural Experiment Station in Bulletin 223 that "The average cost of cooling 100 pounds of milk during 1929 on 11 farms in the vicinity of Providence using electric systems with dry boxes was 14¼ cents." Also that "Fifty men selling an average of 110,960 pounds of milk annually at wholesale, reported 22 pounds of ice used to cool each 100 pounds of milk produced. The average cost of ice delivered to the farm was 42 cents per 100 pounds. At these rates the average total cost of cooling 100 pounds of milk with ice during 1929 was 10 cents. Increased volume tended to lower the costs of ice cooling for each 100 pounds of milk when ice was purchased, but the reduction was not as marked as with electric cooling. The larger the production of milk the greater the chances that electric cooling was cheaper and vice versa."

It is but natural that the public utility man should be interested

in the type and amount of load which milk cooling will bring on his lines. Records secured on Wisconsin and Indiana dairy farms of the current consumed for cooling milk during various months of the year indicate the desirability of this load.

## Period of Peak Load

Several features of the figures reported by the Southern Wisconsin Electric Company, Lake Geneva, Wisconsin are worthy of consideration. The peaks of the annual consumption for these refrigerators come during the summer months of July and August. This is a very desirable feature from the standpoint of the power company, since this tends to offset the depression in the annual load curve of the dairy farm, which naturally occurs at this season of the year due to smaller use of light, reduced use of power for grinding, and in some cases a decrease in power consumed. The average amount of current used by 5 wet installations on Wisconsin farms in 1928 was .929 kilowatt-hour per 100 pounds of milk cooled, varying from .682 to 1.235 kilowatt-hours, during an average season of between 7 and 8 months. Similar figures released by the Agricultural Engineering Dept. of the University of Wisconsin on four farms for 1927 showed an average energy requirement of .955 kilowatt-hour per 100 pounds. One year's result reported by the New York State Agricultural Experiment Station in Bulletin 581 shows an average use of 1.08 kilowatt-hours per 100 pounds where the milk was cooled from temperatures ranging between 59° F. and 84° F. to an approximate temperature of 40° F. The current used for one dry installation in Wisconsin was 1.169 kilowatt-hours per 100 pounds for 5.5 months, while two Indiana installations showed an average use of 1.06 and 1.33 kilowatt-hours per 100 pounds for an entire year's operation according to figures reported by the Purdue University Agricultural Experiment Station.

The exact amount of current required by the different types of installations will vary for the same unit of milk cooled, depending upon the tank or box used and its insulation, the refrigeration machine and methods of cooling the compressor on it, as well as the temperatures through which the milk is cooled by the refrigerator, and temperature of water available for precooling the aerator and for cooling the refrigerator compressor where it is water cooled. Tests conducted at Purdue University by E. N. Knepp a graduate student in the Agricultural Engineering department during the winter of 1929-30 published in the September, 1930 issue of "Agricultural Engineering" indicate a wide difference in efficiency of machines and tanks.

In general it is to be expected that where surface coolers are used with both wet and dry storage boxes under similar conditions that the current consumption per unit will be greater for the dry box than for the wet. Available figures are not conclusive as to the relative costs of power for the wet type which does all of the cooling in the tank as compared with that of the dry storage box and aerator using water to do some of the cooling of the milk. However, the total cost of cooling including interest and depreciation on the investment will probably be less for the wet than for the dry box because of the lower cost of equipment.

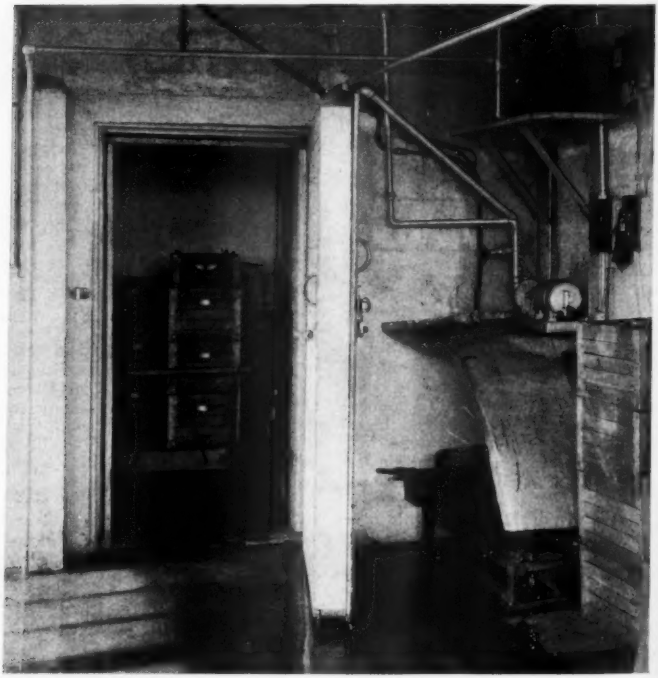
## Governing Factors

The dairy farmer is of course interested in refrigeration if it offers the possibility of greater income or an economical saving in labor. The man who retails his milk, making two deliveries per day may be able to get along without refrigeration of any kind by leaving his surplus in the town butcher's refrigerated box from one delivery to the next. However, the elimination of refunds for occasional sour milk and the saving of the extra labor and mileage for one trip per day may be sufficient to justify his installing a refrigerating machine and dry box in his own milk house as did one Indiana farm dairyman living near Mulberry.

The man who sells his milk in

cans may not be justified in using mechanical refrigeration unless he is receiving a premium for delivering that milk with a bacterial count below a given number. Increasing restrictions on the temperature at which milk may be delivered combined with increased use of Grade A milk with its premium for low bacterial count are influential in the greater use of mechanical refrigeration equipment by farmers who sell whole milk in cans or by those who may be selling sweet cream.

The farmer who is producing milk on a bacterial count basis must not be led to believe that refrigeration is a substitute for cleanliness. It is perhaps, too often the belief that refrigeration is the only precaution required to produce milk of low bacterial content. This is well illustrated by the results of bacterial studies made on an Indiana dairy farm by Professor E. H. Parfitt of the Purdue University Dairy Department before and after the installation of a mechanical refrigerator. Before refrigeration was available there was a wide variation in bacterial counts, some reasonably low, some excessively high. After the installation of the cooling equipment this variation was considerably less, but the *average* count was *higher* than that before he obtained the cooler. This indicates that the farmer eased up on his precautions in sterilizing his milker, thoroly cleaning his utensils, and perhaps on personal sanitation expecting refrigeration to be a sort of panacea for his entire bacterial problem.



**The walk-in type of storage box must be built in its permanent location. Bottled milk as well as cans can be accommodated in this type.**

**PURDUE UNIVERSITY, AGRICULTURAL EXPERIMENT STATION**

**Results of Bacterial Growth in Milk As Affected by Washing of Coolers**

| Condition of Cooler | Ratio of Bacterial Growth | |
|---|---|---|
| | Surface Cooled | Non-Surface Cooled |
| Washed | 5.577 | 2.222 |
| Washed and sterilized | 1.948 | 2.706 |
| Carefully washed and sterilized | 1.929 | 2.515 |

Previous comments have been made on the use of the surface cooler in connection with the use of the wet cooler, and the fact that it is not being used in certain sections of the country. The necessity for the use of an aerator in connection with the dry box has been mentioned and it is of course required for rapid cooling. For that reason Professor Parfitt has made a study of various methods of washing such coolers on bacterial growth of milk passed over them in comparison with the same milk stored in a tank cooler without previous cooling. The results listed in the accompanying table indicate the contamination which the farm dairyman may encounter with ordinary washing methods. Here again the dealer in refrigerating equipment should be in position to advise his customer.

Briefly summarizing the subject of milk cooling, the dealer undoubtedly is facing a market which is certain to increase with the spread of electrification and a desire for higher grades of milk and cream, the power company through the use of mechanical refrigeration equipment on the dairy farm will have a smoother annual load curve for that type of farm and increased revenue, and the farmer will have a new machine to aid him in the economical production of a quality product.

The following bulletins will be of assistance in gaining further information on the subject of milk cooling. Requests should be forwarded to addresses indicated.

"Milk Cooling on California Dairy Farms," Bulletin 495, University of California Agricultural Experiment Station, Berkeley, California; "Electric Dairy Cold Storage," Bulletin No. 233, New Hampshire Agricultural Experiment Station, Dunham, N. H.; "Electric Cooling of Milk on the Farm," Bulletin No. 581, New York Agricultural Experiment Station, Geneva, New York; "The Mechanical Dairy Cooler on Nebraska Farms," Bulletin 249, University of Nebraska Agricultural Experiment Station, Lincoln, Nebraska; "Mechanical Refrigeration of Milk in a Tank Type Refrigerator," Bulletin 268, Oregon Agricultural Experiment Station, Corvallis, Oregon; Report of 1928 and 1929 Rural Electrification Conferences, Purdue University, Agricultural Experiment Station, Lafayette, Indiana; "Costs of Cooling Milk on Farm," Bulletin 223, Rhode Island Agricultural Experiment Station, Kingston, Rhode Island; "The Production of High Quality Milk," Bulletin 300, Vermont Agricultural Experiment Station, Burlington, Vermont; "Dairy Refrigeration Tests," Agricultural Engineering Department, University of Wisconsin, Madison, Wisconsin.

A partial list of manufacturers of refrigerating machinery who are manufacturing machines particularly for milk cooling are:

Copeland Sales Co., Mount Clemens, Mich.; Dairy Refrigeration Co., Milwaukee, Wis.; Electro-Kold Co., Spokane, Wash.; Frigidaire Corp., Dayton, Ohio; General Electric Co., Cleveland, Ohio; Haven Mfg. Co., Milwaukee, Wis.; Kelvinator Corp., Detroit, Mich.; Lipman Refrigeration Co., Beloit, Wis.; Servel Corp., Evansville, Ind.; Welsbach Company, Gloucester City, N. J.; York Ice Machinery Corp., York, Penn.

A number of manufacturers of tank-type milk cooling cabinets are:

Esco Cabinet Co., West Chester, Penn.; Victor Products Corp., Hagerstown, Md.; York Ice Machinery Corp., York, Penn.

# BOB'S PAGE

*Devoted to Merchandising of Electrical Equipment in Rural Communities*

Conducted by Robt. J. Fulton

## Selling Electric Refrigerators

PEOPLE do not buy electric refrigerators as quickly as they do other things—they manage to get along without them. They will buy an electric sweeper because it makes work easier, and they will buy an automobile for its luxury. But interest must be aroused and created in an electric refrigerator.

FIRST SELL ELECTRIC REFRIGERATION!!

What are the big, broad advantages found in the electric refrigerator which have their appeal to every person with a home, regardless of how large or small it may be? Broadly speaking, there are three groupings.

1. Electric refrigeration affords undreamed of comforts and conveniences to the home.

2. Electric refrigeration effects economies both in food preservation and in operating cost over any other known system of refrigeration.

3. Electric refrigeration keeps food in better condition.

Now to analyze the comforts and conveniences which are enjoyed where there is electric refrigeration:

1. There is continuous refrigeration without interruption. The family can be away for a day or a week and the electric refrigerator will be just as cold when they return.

2. It is not necessary to depend upon an ice crop.

Should the current fail at any time, the motor, if running, would simply stop. And, when the flow of current is resumed, the motor would start up again without causing any trouble. Furthermore, the refrigerating unit in most electric refrigerators contains enough reserve cooling to keep the box cool for a number of hours under ordinary conditions.

The next point to emphasize is the temperature control, if the unit has one. Explain the thermostatic action—45° Fahrenheit is the average temperature required for keeping food at its best in a refrigerator.

The action of the refrigerant in the cooling unit should be explained. This is not given in detail here as all refrigerators are not exactly alike.

### Cabinet Details Essential

Details regarding the cabinet and its insulation should also be brought out. The efficiency of any refrigerator, whether it is electric or not, depends upon the kind and amount of insulation material used and also upon the manner in which it is installed within the cabinet walls. A prospective customer should also be acquainted with the fact that only 20% of the cold air is lost by way of opening and closing of cabinet doors and the other 80% through insulation. It has been proven that if an inch of cork board insulation is added to an ordinary 100-pound ice box at an increased selling cost of $20, the saving in ice consumption alone would bring a return of 18% on the investment over and above the better refrigeration secured and the amount of food spoilage averted. Therefore, it is essential that good insulation be stressed to a great extent.

Make a romance out of whatever appliance you are selling — there is one—it is up to you to find it and then use it and see how much quicker your prospect will become interested in your ap-

pliance whether it is an electric refrigerator or other appliance.

Any of the companies whose refrigerators you are now handling have a history of refrigeration. Be sure and get it as you will find it contains many interesting facts on how our ancestors cooled their foods by placing them in cold cellars, natural caves and fruit cellars. Some people are still doing this. Another method used was to pipe a running spring with it cooling water through a cabinet arrangement and thus to a certain extent prevent the spoilage of food.

The ancient Egyptians knew that water could be cooled by evaporation. For ages the Hindoos have produced frost artificially by a skillful manipulation of evaporation and radiation.

In 1850 Dr. Gorris invented the cold air refrigeration machine that was later developed. This was the first large application of mechanical refrigeration and was used in commercial work exclusively. It was also used for transporting meats and other foodstuffs overseas. Next followed the invention of making ice by the ammonia absorption process, discovered by Ferdinand Carre in 1860.

Possibly you never knew these facts before? Aren't they interesting? Doesn't electric refrigeration seem nearer and more interesting to you now? You can familiarize yourself with such details if you will study the literature furnished by manufacturers of appliances and equipment. Knowledge of this kind will not only broaden you but will make you a more valuable merchandiser to yourself, your employer, your community and to the manufacturer, also.

## New Stover Pump Jack

Announcement is made by the Stover Mfg. & Engine Company of Freeport, Illinois, of a new pump jack which has just been added to their extensive line. Known as No. 19, the new model is a direct-connected, gear driven motor equipped unit for electric installations. Designed especially for those who prefer a small size compact electrically gear driven unit, and supplied as No. 19 with ¼ H.P. motor and as No. 19A with ⅓ H.P. motor.

## New Century Products

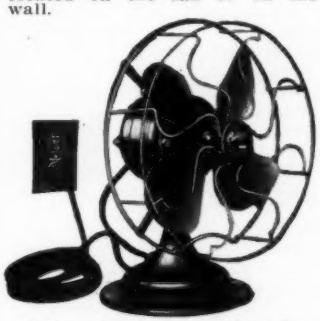
The Century Electric Company, of St. Louis, Missouri, have added two new units to their line of portable, ceiling and ventilating fans.

The eight-inch 1-speed stationary fans for alternating current have a fully-enclosed, pressed steel frame, induction type motor, pressed steel stand, steel wire guard, steel blades, phosphor bronze bearings and a switch in the base. It is finished in lustrous black.

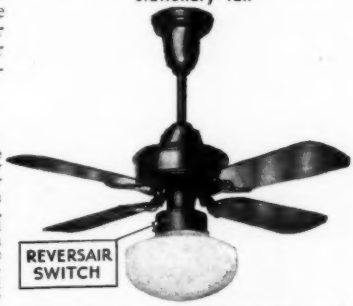
The Century Wool Yarn System of Lubrication is used, which makes it necessary to oil the fan only once each season.

The fan can easily be arranged for side wall mounting.

The Century "Reversair" 36- and 60-inch A. C. ceiling fans are electrically arranged for reversing the direction of the rotation of the fan, and, accordingly, the direction of the movement of the air, permitting either upward or downward air delivery. No mechanically moving parts are require to reverse the air movement, but, instead a switch is located on the fan or on the wall.



Century 8-inch one speed A. C. stationary fan

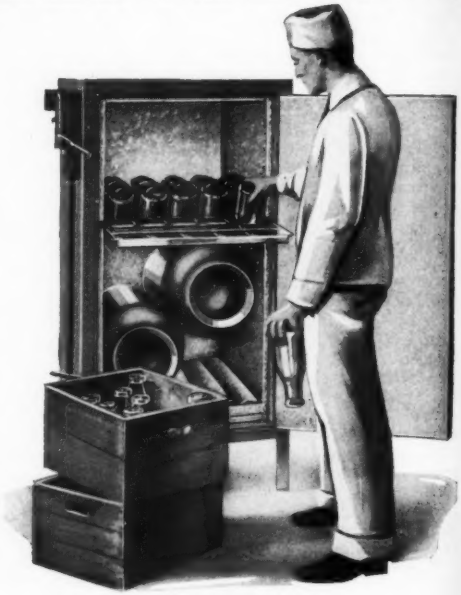



The Century "Reversair" 36 and 60-inch A. C. ceiling fan

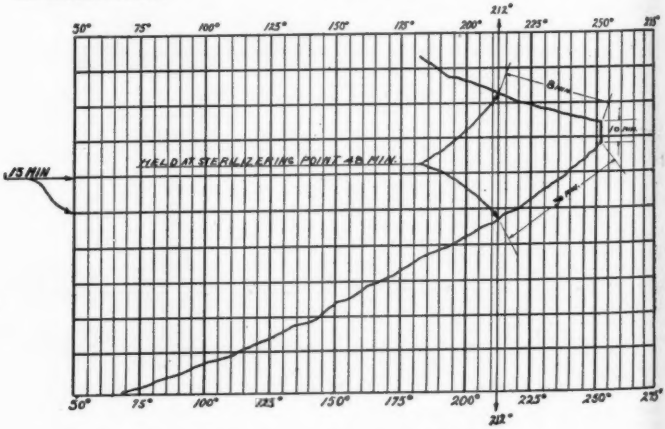
## A New Electric Dairy Sterilizer

One of the rural dairyman's problems is to produce milk low in bacteria count. The electric milk cooler has done much to help solve this problem by providing a means of quickly cooling and storing milk after it is produced. The electric dairy water heater has also assisted in this connection by providing a supply of hot water in the milk house for washing utensils, but the use of hot water in washing dairy utensils does not entirely eliminate bacteria, and in many instances a utensil which appears to be shining and bright and perfectly clean, will be contaminated in an unseen crevice.

It has long been known that the only way to make dairy utensils absolutely clean and sterile without the use of chemicals was first to wash them thoroughly in hot



Interior View of Sterilizer




Graph Indicating Performance of Sterilizer

## BRILLION-BEVAN

Line of
Electric Farm Equipment

Electric Pumpers
Pump Jacks
Water Systems
Electric Farm Grinders

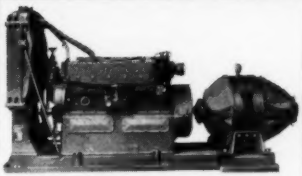
BRILLION IRON WORKS
Brillion, Wis.

## Blue Ribbon Electric Milker

**A Portable Milker Requiring No Installation**

The "Blue Ribbon" is a self-contained milker, requiring no pipe lines or extra equipment of any kind. It operates direct from the light socket of either high line or farm light plant. A beautiful catalog and complete information will be sent on request. Write us today.

**Electric Products Corporation**
7 Bluff Ave., La Grange, Ill.



## BIG PROFITS IN BIG INSTALLATIONS

1½ KW to 35 KW AC and DC

## UNIVERSAL ELECTRIC PLANTS

Big money lies in the sale of big plants. The Universal line enables you to make large installations of every kind. These self-contained plants are made in a range of sizes from 1½ to 35 KW both AC and DC and in portable, stationary and marine types; in standard as well as special voltages; and for operation with or without storage batteries.

Four, six and eight cylinder gasoline engines are built as a unit with electrical parts especially designed for the engines. Easy starting, smooth running, correct electrical characteristics, unfailing operation and long life are prominent Universal features. Thousands of units in use over a period of years.

The Universal line in itself has proved a highly profitable proposition to hundreds of dealers who sell it exclusively. Others find its range of sizes the ideal complement to a line of smaller household units. A few new dealer franchises are available. Complete information on request to Universal Motor Company, 70 Universal Drive, Oshkosh, Wisconsin.

Universal MOTOR CO.
MOTOR CO.
OSHKOSH, WIS., U.S.A.

water and then expose them to heat of at least 212° Fahrenheit. The method most generally used heretofore, has been steam. This method has been in general use by a number of large dairies and creameries, but there has been no cheap method particularly adaptable for the average milk producer. An electric dry air dariy utensil sterilizer which was recently exhibited for the first time at the State Farm Products Show at Harrisburg, Pennsylvania, will be of material help to the latter. It is built by the Esco Company of West Chester, Pa.

The sterilizer is designed for use in the rural milk house, and is constructed in three convenient sizes, a size to accommodate dairies from twelve to sixty cows. It is adapted to operate from the ordinary light line. It is entirely automatic—to use it the dairyman merely places the utensils inside, pushes the starter button, and the temperature goes up to 250 degrees and automatically cuts off. The utensils may be left in the sterilizer until the next milking. In this way, it provides not only sterilization for the utensils, but a clean, dry, sterile storage place.

The performance of this new electric sterilizer is indicated by the graph chart herewith. It is a reproduction of the chart taken from a recording potentiometer after a test.

It will be noted from this chart that the temperature in the sterilizer went up to 250 degrees in approximately one hour and thirty minutes, and that the inside temperature was held at or above the point of sterilization or 212 degrees for 48 minutes.

## New G. E. Handy Floodlight

The General Electric Company, Schenectady, New York, have announced a 100-watt general utility floodlight projector, known as the Novalux Handly Floodlight. This projector is designed for applications where light requirements do not necessitate the larger standard floodlighting units. The unit weighs less than three pounds and measures less than 9 inches wide, 10 inches deep and 13 inches high with supporting stand. Built for a 100-watt inside-frosted general-service incandescent lamp with 4⅝ inch light center and medium screw base.

## A Star Salesman

(*Continued from page S4*)

Seven wiring jobs

Total Sales.....$5,051.90

### JULY

Seven washing machines
Four domestic refrigerators
Four electric ranges
Three wiring jobs

Total Sales.....$2,330.41

### AUGUST

Two washing machines
Three domestic refrigerators
One electric range
Two electric radios
Six wiring jobs

Total Sales.....$2,085.50

### SEPTEMBER

Three washing machines
Two domestic refrigerators
Six ironing machines
Two electric radios
Fifteen wiring jobs

Total Sales.....$2,672.55

## New Paint Spraying Outfit

Spray painting, although a relatively new idea, has shown a substantial increase, and is one of the reasons for the latest addition to the Presto line of spray painting equipment—model 126. This model is a portable, direct-drive outfit for applying both light and heavy materials. The size of spray and amount of material applied may be governed by the operator. The Metal Specialties Mfg. Co., Chicago, are the manufacturers of this new unit.

## COMING MEETINGS

ILLINOIS STATE ELECTRIC ASSN. (N.E.L.A.) Convention at Springfield, Ill., March 12-13, 1931.

SOUTHEASTERN GEOGRAPHIC DIVISION. (N.E.L.A.) Next meeting at Vinoy Park Hotel, St. Petersburg, Fla., April 1-3, 1931.

MISSOURI ASSN. OF PUBLIC UTILITIES. Annual state convention April 16, 17, 18, 1931 at Excelsior Springs, Mo. Jesse Blythe, Assistant Secretary, Merchants Bank Bldg., 103 West High St., Jefferson City, Mo.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS. (North Atlantic Sec.) F. L. Rimbach, Chairman, Rural Electrification Comm.; O. B. Stichter, Secy. Next meeting at New Brunswick, N. J. Date to be announced later.